

## DUTCH STUDIES

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*founded by Walter Thys*

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# DUTCH STUDIES

VOLUME 4

## *Studies in Dutch Phonology*

edited by

Wim Zonneveld, Frans van Coetsem, Orrin W. Robinson



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## TABLE OF CONTENTS

Editorial Statement	VII
Preface	IX
Bibliographical Abbreviations	XI
The Authors	XIII
 Introduction: The Role of Dutch in Recent Phonological Issues	
WIM ZONNEVELD . . . . .	1
Structure Conditions for Initial Position in Standard Dutch	
DANIEL T. BRINK . . . . .	17
Word Frequency and Lexical Diffusion in Dialect Borrowing and Phonological Change	
MARINEL GERRITSEN and FRANK JANSEN . . . . .	31
Brabantian Sandhi and the Abstractness Debate	
DIDIER L. GOYVAERTS . . . . .	55
Morpheme Boundaries and Syllable Boundaries: A Case for Natu- ral Phonology	
JAN G. KOOIJ . . . . .	61
The Stress Pattern of Dutch Simplex Words: A First Approxima- tion	
JAAP VAN MARLE . . . . .	79
On Vowel Reduction in Dutch	
STANISLAW PRĘDOTA . . . . .	123
Dutch Diminutives over easy	
ORRIN W. ROBINSON . . . . .	139
Past Participle Prefix <i>ge-</i> Deletion and the Role of Stress in Dutch Complex Verbs	
ANKE DE ROOIJ-BRONKHORST . . . . .	159
Boundaries, Wordclasses, and the Accentuation of Derived Words in Dutch	
HENK SCHULTINK . . . . .	205

Inflectional Aspects of Adjectives in the Dialects of Dutch-speaking Belgium	
JOHAN TAELEDMAN . . . . .	223
Some Theoretical Implications of Stem Alternations in Dutch Diminutives and Plurals	
PETER TIERSMA . . . . .	247
Egg, Onion, Ouch! On the Representation of Dutch Diphthongs	
WIM ZONNEVELD and MIEKE TROMMELEN . . . . .	265
The Looking Glass War: On the Role of Hypercorrection in Phonological Change	
WIM ZONNEVELD . . . . .	293

## EDITORIAL STATEMENT

In 1974 the first volume of *Dutch Studies. An annual review of the language, literature and life of the Low Countries* was published. Since that time two further volumes have appeared, in 1976 and 1977. The initiative in the matter was taken by the Committee of the International Association for Dutch Studies (Internationale Vereniging voor Neerlandistiek), and particularly by its first president, Walter Thys. It is not a matter for surprise that this organisation, consisting of teachers of Dutch at foreign universities, most keenly felt the need of a periodical in which important aspects of Dutch language and literature and the cultural history of the Dutch-speaking areas would be dealt with in a more generally accessible language. First of all there was the necessity of introducing aspiring students of Dutch to the field, and, secondly, "there [had] for too long been a conspicuous lack of publication and interest in the Dutch language area as compared to the surrounding disciplines, German, French, Scandinavian and the rest", as Dr. Thys put it. It was hoped that the review would stimulate a wider interest in the Dutch cultural context, and acquaint foreign scholars with the results of investigations in, or pertaining to the Netherlands and the Dutch-speaking part of Belgium that could be relevant to their own pursuits.

Understandably, *Dutch Studies* aspired to cover a broad field of interest. In the first three volumes sections were devoted to linguistics, literature, history, reviews, general information and bibliography. Some of the articles informed foreign readers of the general state of affairs in a particular field of research, others concentrated on a specific subject, sometimes in an international comparative or a particular theoretical context.

After some time it became increasingly clear that the initial design of the series did not work well enough in practice. In fact, it faltered between two opinions. On the one hand it aimed at providing diversified information on Dutch cultural affairs, on the other it attempted to give foreign scholars an adequate idea of what is going on in their specialized sphere of interest in the Dutch-speaking area. The two envisaged objects appeared irreconcilable.

Consequently the decision was taken to discontinue *Dutch Studies* in its original form. A new board of editors was asked to consider the possibilities of a fresh start. After some discussion it was agreed upon that the second aspect, to furnish information about the way in which Dutch specialists and foreign scholars using Dutch material in a certain field of research contribute towards the development of their discipline, was the most relevant one. This conception resulted in a new design: henceforth the contributions in each separate volume of *Dutch Studies* will concentrate on a well-defined subject, in which the general comparative and theoretical implications of research will be expressly made clear. By sacrificing the function of a source of general information, it is hoped to attain a more important goal: the integration of 'Dutch' efforts in a particular field in an international context.

Consequently the editorship of each successive volume will be committed to a small group of specialists in that specific field. As Vol. IV covers Dutch phonology, Wim Zonneveld, Frans van Coetsem and Orrin W. Robinson have been asked to act as editors for the present collection.

Future volumes will be concerned with e.g. medieval Dutch literature and with modern Dutch literature.

G. Geerts  
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## PREFACE

The fourteen papers in this volume *Studies in Dutch Phonology* were collected by the editors in the course of 1977 and 1978, at the request of the editorial board of *Dutch Studies*. In their opinion the collection represents a fair cross-section of current research done in the field of phonology both inside and outside the Netherlands, and therefore constitutes a very suitable starting point for the new series *Dutch Studies* of the Internationale Vereniging voor Neerlandistiek. In the various contributions one will find treated several issues of current phonological interest, such as phonotactic constraints (by Brink), abstractness (by Goyvaerts, Robinson, Tiersma, Trommelen and Zonneveld), stress-assignment and vowel-reduction (by Van Marle and Predota), the interaction between phonology and morphology (by Kooij, De Rooij-Bronkhorst, and Schultink), rule ordering (Taeldeman), and lexical diffusion (Gerritsen and Jansen, and Zonneveld). These issues are discussed in relation to a number of well-known traditional topics of Dutch phonology, such as: affixal stress-attraction; constraints on consonant-clusters; separable and inseparable verb-forms; stress and vowel reduction in derived vs. non-derived, and 'native' vs. 'foreign' Dutch words; Auslautverhärtung and assimilation of voice in obstruent-clusters; regularity and irregularity in open syllable lengthening, diminutive formation, plural formation, and the weakening of intervocalic *d*; and the properties and phonological representation of diphthongs. (Frans van Coetsem's paper "Loan Phonology: the Example of Dutch", originally intended as a contribution to this volume, but not completed as it went to the press, will appear elsewhere.) In order to preserve the authenticity of the papers the editors have refrained from providing a single general bibliography, and have not attempted to stimulate cross-referencing among the authors. Inspired diversity rather than tightness has been their goal. They assume that this volume will be worth its existence if it contributes to a better understanding of the phonological structure of a currently very much under-researched language.

Wim Zonneveld  
Frans van Coetsem  
Orrin W. Robinson

## BIBLIOGRAPHICAL ABBREVIATIONS

ALH	= Acta Linguistica Hafniensia
ANPE	= Archives Néerlandaises de Phonétique Expérimentale
AS	= American Speech
AVP	= Archiv für Vergleichende Phonetik
CLS	= Regional Meeting of the Chicago Linguistic Society, Chicago, Ill.
FdL	= Forum der Letteren
FoL	= Foundations of Language
Hand	= Handelingen van de Koninklijke Commissie voor Toponymie en Dialectologie
IJAL	= International Journal of American Linguistics
IULC	= Indiana University Linguistics Club, Bloomington, Ind.
JoL	= Journal of Linguistics
JoP	= Journal of Phonetics
LA	= Linguistic Analysis
LB	= Leuvense Bijdragen
Lg	= Language
LI	= Linguistic Inquiry
LingB	= Linguistische Berichte
LS	= Language Sciences
LSoc	= Language in Society
Med	= Mededelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afdeling Letterkunde, Nieuwe Reeks
NTg	= De Nieuwe Taalgids
OSU WPL	= Ohio State University Working Papers in Linguistics
OT	= Onze Taaltuin
PiL	= Papers in Linguistics
SL	= Studia Linguistica
Sp	= Spektator
SWI	= Selected Writings I: Phonological Studies, Mouton, The Hague, 1962.

TCLP	= Travaux du Cercle Linguistique de Prague
TL	= Taal en Letteren
TLV	= Tijdschrift voor Ind. Taal-, Land-, en Volkenkunde
TNTL	= Tijdschrift voor Nederlandse Taal- en Letterkunde
TT	= Taal en Tongval
UWPL	= Utrecht Working Papers in Linguistics
Versl	= Verslagen en Mededelingen van de Koninklijke Vlaamse Akademie voor Taal- en Letterkunde

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## INTRODUCTION:

### THE ROLE OF DUTCH IN RECENT PHONOLOGICAL ISSUES

WIM ZONNEVELD

Recently a revival has manifested itself of the interest of Dutch linguists in the role of their predecessors in the establishment, some fifty years ago, of the 'structural' or 'functional' view of linguistics, in particular that of structural 'Praguian' phonology.\* In fact, in the last two years at least four works have appeared which deal with this subject as a single issue, albeit to different degrees of detail, and from slightly different angles. E.M. Uhlenbeck's 'Roman Jakobson and Dutch Linguistics', a contribution to a 1977 volume in honour of Roman Jakobson, summarizes Jakobson's contacts with and influence upon the Dutch linguistic community, especially in the thirties. Parret and Van de Velde's 'Structuralism in Belgium and the Netherlands' is a general paper surveying Dutch and Belgian contributions to structural linguistics in general, and tries to determine the specific nature of Dutch structural linguistics. Pollmann's (1979) 'J. van Ginneken en de Taalbiologie' focuses on the mentioned linguist's preoccupation with 'biological' linguistics. And finally, it is argued in the brief 'Background' to Zonneveld (1978: 1-3) that the apparent front role of Dutch phonologists in the establishment of Praguian structural phonology in the thirties has not been maintained in the forties and fifties, and that later Dutch linguists played no role of importance in the development of generative phonology as a subpart of transformational-generative grammar in the fifties and sixties. I intend to recapitulate here briefly how Dutch linguists helped phonology gain ground, how they contributed to its theoretical maturation, and then lost touch with prevailing international trends. Secondly, I will provide a brief survey of how the study of Dutch has contributed in roughly the past twelve years to the development of generative phonology.

Although it would be unwise and certainly counterfactual to claim that

\* I am grateful for comments on a preliminary version of this paper to Frans van Coetsem, W. Gerritsen, Hans Giljamse, Wus van Lessen Kloeke, Thijs Pollmann, Stanislaw Prędota, and Mieke Trommelen.

structural phonology was conceived at The Hague in 1928, or even to say that the 1928 Congress of Linguists constitutes a clear breaking point in the historical development of the science of linguistics, there is also no reason, in retrospect, to underestimate the influence exerted by the Congress towards the encouragement and development of the study of phonological structure. Purely factual considerations support this view, such as the fact that the Congress was followed by an International Phonological Meeting in Prague (1930); by further linguistic congresses in Geneva (1931), Rome (1933), and Copenhagen (1936); and phonetic congresses in Amsterdam (1932), London (1935), and Ghent (1938). Furthermore, before World War II the *Travaux du Cercle Linguistique de Prague* had witnessed 8 issues; two major monographs were written: Trubetzkoy's *Grundzüge der Phonologie* (TCLP 7, 1939), and Van Wijk's *Phonologie, een hoofdstuk uit de structurele taalwetenschap*; and the structural view of phonology was expanded in numerous articles on a wide variety of topics. It is of considerable importance to note, then, that the initiative to the Congress had been taken by a group of Dutch scholars, headed by C.C. Uhlenbeck of Leiden, and J. Schrijnen of Nijmegen 'who felt that the wounds of World War I were sufficiently healed to permit an international exchange of ideas' (E.M. Uhlenbeck, 1977: 483). This initiative was in many ways the result of the existing linguistic climate in Holland, as Uhlenbeck (op. cit.: 487) points out: 'There are many signs that at least the leading Dutch linguists of this period were aware that the supremacy of the Neogrammarians was coming to an end, and that linguistics was changing'. The Congress was attended by over 300 scholars, more than 100 of whom were from the home country. The Prague phonologists were able to present their well-known theses and apparently contrary to their own expectations 'they were received by many with warm approval and by all with interest and sympathy' (op. cit.: 480).

Among the Dutch attendants of the Congress were four linguists who are time and again mentioned as belonging to the forerunners of the linguistic developments in the decade after (cf. Uhlenbeck, 1966: 11-2; Vachek, 1968; Parret and Van de Velde, 1979: 70): N. van Wijk, A.W. de Groot, Jacq. van Ginneken, and H.J. Pos. Of these, the former two are most outstanding ('the pioneers of modern linguistics in the Netherlands', Schultink, 1970: 20). not least since the topics of early structuralism coincided to a considerable degree with their individual lines of research: Van Wijk was an etymologist (cf. Franck-Van Wijk, 1912) as well as a Slavonic philologist (cf. Van Wijk, 1931), and De Groot a classi-

cist and general linguist. After a period of critical if not sceptical appraisal (to wit several articles in the Dutch journal *De Nieuwe Taalgids* where he recalls the work of Brugmann, Meillet, and Schuchardt), Van Wijk enriched the phonological debate with a series of papers which are essentially benevolent reactions to Jakobson's 'Prinzipien der historische Phonologie' (Van Wijk, 1937, 1938, 1939a). In addition to Jakobson's theory of 'phonologische Mutation', with its tripartite subdivision into 'Entphonologisierung', 'Phonologisierung', and 'Umphonologisierung', Van Wijk stresses the systematicity of 'extra'-phonological change, that is, systematic change not in the phonemic system, but in the system of those non-phonemic sounds which the native speaker is able to discriminate in his native language. He provides examples from Dutch and the Slavic languages as illustrations of his ideas (for further discussion cf. Fischer-Jørgensen, 1941: 83; 1975: 43). In 1939 Van Wijk presented his own views on structural phonology in his Dutch monograph *Phonologie, een hoofdstuk uit de structurele taalwetenschap*. Fischer-Jørgensen (1941: 61) calls this book and Trubetzkoy's *Grundzüge* 'die beiden grossen Gesamtdarstellungen' of structural phonology (similarly Uhlenbeck, 1966: 11). As a survey of the state of the field in the late thirties she finds it preferable to *Grundzüge*, and she welcomes Van Wijk's elaborate treatment of diachronic phonology. Similarly favourable judgements are given in reviews by Van Wijk's Dutch contemporaries Van Ginneken (1939a), Kruisinga (1939), and C.C. Uhlenbeck (1939). Van Wijk's last contribution to structural phonology is his 1940 'Quantiteit en Intonatie', influenced by Jakobson's 'Observations sur le classement phonologique des consonnes' (1938). It is the first article to touch on the potential of binary oppositions. Van Wijk died in March 1941, and in the foreword to *Fundamentals of Language* Jakobson dedicated the series *Janua Linguarum* to Van Wijk, calling him 'one of the outstanding pioneers in the inquiry into the structure of language and into the principles of its evolution'.

A.W. de Groot was a supporter of structural linguistics from the very start. In his 1929 report of the Hague Congress in the journal *Vragen des Tijds* he characterizes the viewpoints put forward there as a 'turn of scientific ideas', resulting in a 'deeper insight into the relation between the elements of a language, in particular between the sounds [and] into the relation between sound and meaning' (424).<sup>1</sup> He emphasizes the importance of the work by Jakobson, Karcevskij, and Trubetzkoy. In 1930 he attended, together with Van Ginneken, the 'very exclusive' (Vachek, 1968: 5) International Phonological Meeting in Prague where he delivered

a paper entitled 'Phonologie und Phonetik als Funktionswissenschaften' published in *TCLP* 4 (1931a). From this paper and his publications in *De Nieuwe Taalgids* from the same period it appears that he viewed this relation as much more direct than most of his contemporaries, describing, for instance, the Dutch vocalic system directly in terms of phonetic investigations by Zwaardemaker and Eijkman (1928). Apparently, these views were divergent enough to warrant explication in a separate paper (1931b). From then on his work linked in closely with that of Trubetzkoy and Jakobson in a series of papers: 'Zur Grundlegung der allgemeinen Versbaulehre' (1933), 'L'accent en allemand et en néerlandais' (1939a), and the insightful sequence of 'Neutralisation d'oppositions' (1939b), 'Structural Linguistics and Phonetic Law' (1941a), and 'Voyelle, consonne, et syllabe' (1941b). In spite of its title, 'Neutralisations d'oppositions' heavily attacks the notion of neutralization as defended by Trubetzkoy and Martinet. Instead, De Groot argues in favour of the notion of 'defective distribution'. For further comments on this the reader is referred to the discussion in Davidsen-Nielsen (1978: 37-41). In 'Structural Linguistics and Phonetic Law' De Groot provides a discussion of the notion of 'Ausnahmslosigkeit' of sound change from a structural point of view. Together with Van Wijk (1938), this paper makes an interesting combination of Dutch structural ideas on diachronic phonology. In 'Voyelle, consonne, et syllabe' De Groot applies Jakobson's 1938 notion of the binarity of phonological oppositions to an analysis of the phonological system of Dutch, developing the article into a treatment of the distinction of the phonological syllable in Dutch vs. several Romance languages, as relevant today as it was forty years ago.<sup>2</sup> After 1945 his classicist interest in accent and rhythmical patterns led De Groot to occupy himself almost exclusively with syntax (cf. De Groot, 1949, 1962). According to Vachek (1968: 11) his most important contribution to Praguian phonology is the recognition of so-called 'Komplexqualität', apparent as early as 1929 in his contribution to the *Schrijnen Festschrift*. In cases of *Komplexqualität* there is not an opposition in terms of the presence vs. the absence of *one* phonological property, but, rather, several of these, such as in the coexistence of stress, quality and pitch. While one might be led to interpret this to some degree as an anticipation of Jakobson's later idea of the phoneme as 'a bundle of distinctive features' (cf. Jakobson, 1962: 641-2), De Groot himself took a firm stand against this view of the phoneme since he insisted 'on the presence of a definite hierarchy of such qualities: one of the coexisting qualities is essential in such cases, the other one (or ones), however, accessory' (Vachek, 1968: 11). This hierarchy vanishes

if the phoneme is considered as a mere collection of distinctive features (see also below).<sup>3</sup>

Jacq. van Ginneken occupies a special if not somewhat unorthodox position among the students of structural phonology because of his pre-occupation with 'biological' or 'genetic' linguistics of which Pollmann (1979) gives a preliminary account (see also Vachek, 1968: 10). Despite the fact that many doubt the compatibility of his own views and those of the Prague scholars (Vachek op. cit.; Uhlenbeck, 1977: 490), he was just as A.W. de Groot an early supporter of Praguian phonology. He joined the 1930 Phonological Meeting in Prague. He also delivered the Presidential Address to the 1932 Phonetic Congress in Amsterdam where, in an overview of the state of phonetics in the early thirties, he called in his jovial words phonology 'le couronnement de l'oeuvre entière' (Proceedings: 15).<sup>4</sup> In 1924 he wrote a reasonably sized structural phonology of Dutch consisting of three subsequent articles in the periodical *Onze Taaltuin* of which he was the editor. He added several articles on Dutch phonology in later issues of the journal. Between then and his death in 1945 he was honoured on the occasion of his sixtieth birthday with the volume *Mélanges de Linguistique et de Philologie offerts à Jacq. van Ginneken*, containing contributions by, among others, Jakobson, Van Wijk, Trubetzkoy, and Schrijnen. He contributed to the 1939 Trubetzkoy Memorial Issue of *TCLP* with a paper entitled 'Ein neuer Versuch zur Typologie der ältern Sprachstrukturen'.

Finally, H.J. Pos deserves mentioning here. While not strictly a phonologist (Uhlenbeck, 1977: 492 ranks him among the great Dutch philosophers of the pre-war period), Pos is praised by many for 'deepen[ing] the insight of linguists into some more general aspects' (Vachek, 1968: 13-4) such as the natural strive of structural phonology towards generality and the binarity of phonological oppositions, and its natural relation to semantics (cf. Jakobson, 1962: 637; Uhlenbeck, 1948: 314). His articles in this area include 'Quelques perspectives philosophiques de la phonologie' (1933), 'Phonologie en betekenisleer' (1938), and especially 'Perspectives du structuralisme' (*TCLP* 8, 1939).

The survey of works by N. van Wijk, A.W. de Groot, Jacq. van Ginneken and H.J. Pos enumerated here provides a picture of the Dutch contributions to pre-war structural phonology. After 1945, Dutch linguists were unable to maintain their outstanding position. While important theoretical developments took place in especially Denmark and the United States of America, Dutch linguistics slowly but surely lost touch with these international trends. E.M. Uhlenbeck, the author of a fairly

straightforward structuralist dissertation on Javanese in 1949, sketches the state of affairs in his 1960 survey of Dutch linguistics as following from a 'lukewarmness about keeping abreast with what is going on in language studies outside the Netherlands' (63).<sup>5</sup> He endows the prominent Dutch scholars De Vooys and Van Haeringen with 'a greater affinity to linguistic practice rather than theoretical reflection' (57).<sup>6</sup> Schultink (1974: 24-5) observes that '[a]mong the structuralist exponents of modern Dutch grammar . . . a noticeable tendency towards eclecticism . . . together with an understandable preference for publishing in Dutch, has seriously limited [the] capacity for contributing to international studies'. This description seems to fit, for instance, the leading men of the flourishing Dutch school of geographical linguistics and dialectology, such as Heeroma, Kloeke, Weynen, and others. The major activities in the theoretical study of Dutch structural phonology in this period take place in a time-span of roughly a decade, from 1958 to 1968. This includes monographs by Van den Berg: *Foniek van het Nederlands* (1958), Cohen et al.: *Fonologie van het Nederlands en het Fries* (1959), Morciniec: *Distinktive Spracheinheiten im Niederländischen und Deutschen* (1968), and chapter V 'Het Woord' of A.W. de Groot's *Inleiding tot de Algemene Taalwetenschap* (1962). While Van den Berg and Cohen et al. have become classics of Dutch structural phonology, and have gone through a considerable number of reprints, they (and the same holds for Morciniec) add little to, and often do not even discuss, the insights of their predecessors. Alien to these insights is the fact that the authors of the *Fonologie* fail to separate quite often phonetic and phonological argumentation in a search for the inventory of Dutch phonemes, while *Foniek* is an uncritical survey of sometimes quite divergent if not incompatible language-particular points of view. The state of the field is perhaps most adequately characterized by A.W. de Groot (1962: 153-4) who, in a section on the structure of the phoneme, rejects under the heading of 'Other Points of View' Jakobson's definition of the phoneme as 'a bundle of concurrent distinctive features' by pointing out that the phoneme is an independent and primitive entity, that affricates and aspirates deny the concurrence of features, and that the notion of distinctiveness neglects the redundant character of many properties. Precisely *these* matters had been dealt with and explained within the Jakobsonian framework by Halle (1957).

As pointed out by Shetter (1972: 1389-90) only one issue of some importance emerges from the post-war study of structural phonology in the Netherlands: the status of the vowels written *ie*, *uu*, and *oe* on the one hand, and those written *ee*, *eu*, *oo* on the other. Phonologically, both

groups pattern with the long monophthong *aa*, but phonetically the first group is relatively short except before *r*, while the latter group is (often) phonetically diphthongized. The first to touch upon the subject is Van Haeringen (1958), who attempts to show that the relevant observations cannot be easily fit into the pre-war accounts of the Dutch vocalic system by Van Wijk, De Groot, and Van Ginneken, to which Heeroma (1959) is a rejoinder. Moulton (1962), a contribution to the *Studia Gratiulatoria* dedicated to A.W. de Groot, embeds the discussion into an overview of previous analyses, showing an admirable awareness of the distinction between phonological and phonetic argumentation. While this is useful as far as it goes, he provides in conclusion a large-scale single system comprising all Dutch vowels which by its very nature fails to separate regularities from idiosyncrasies. Damsteegt (1968) then adds to the confusion in ignoring both Moulton (1962) and the interesting results of the phonetic investigations of the vowels involved in the early sixties by phoneticians at Amsterdam and Eindhoven. The synopsis of the discussion by Shetter (1972: 1390) to the effect that 'it is hard to read the stubborn attacks on this problem without feeling that . . . it does not lend itself to a traditional phonemic solution at all' seems most apt (for further discussion, cf. Zonneveld and Trommelen, 1979).

In his survey article Shetter (1972: 1397), in a restatement of Schultink's label 'eclecticism', also points out that the 'very vigor of the native linguistic tradition seems to have prevented generative grammar from making any very strong impact yet'. Shetter wrote this in 1968 (op. cit.: 1398), at which point in time Dutch transformational grammar was represented by Kraak's dissertation *Negatieve Zinnen* (1966), a review article thereof by Seuren (1967), and Kraak and Klooster's monograph *Syntaxis* (1968). Schultink (1974), the English version of a 1970 lecture, is slightly more optimistic in its observation that in 'the transformational-generative school . . . the Dutch transformational grammarians take their modest but internationally recognized place' (25). Yet he does not elaborate upon Shetter's small list of two years earlier. At the same time transformational-generative grammar was under heavy attack from Reichling (1961, 1967) and Uhlenbeck (1963, 1966), an attack characterized by allegations such as:

I am afraid that the transformational model, as we have it here, will be granted a long but not a very happy life in the linguistic world (Reichling, 1961: 17).

transformational theory will take us along a road perhaps valuable for those who are interested in modern logic; for linguists it will turn out to have been a blind alley (Uhlenbeck, 1963: 18).

Not unexpectedly, also transformational-generative phonology took some time in making its influence felt in the Netherlands. By and large the generalization holds that in the late sixties and early seventies research in the generative phonology of Dutch was executed either by foreigners or by Dutch scholars working abroad, as will appear from the brief survey below.

De Rijk's (1967) unpublished MIT-paper is the first work on Dutch within the generative framework, although it has many structural overtones in being primarily concerned with the 'symmetry' of the vowel system rather than with evidence from alternations which characterizes phonological research after Chomsky and Halle (1968) and Kiparsky (1968). As far as I am aware, in the past decade serious theoretical issues of the generative kind have been illustrated with material from Dutch in four separate instances.

First, Bach (1968: 130-1) illustrates his currently fruitful notion of 'neighborhood rule' with the phenomenon of voicing assimilation in Dutch.<sup>7</sup> Taking the following three generalizations from Koolhoven (1962):

- (i) in a sequence of two stops, if one of the stops is voiced, so is the other,
- (ii) in a sequence of a stop and a spirant, the stop determines the voicing value of the spirant,
- (iii) a sequence of two spirants is always voiceless,

Bach proposes the following two neighborhood rules, where the environmental condition is read as 'next to':

$$(iv) \quad (a) \quad \begin{bmatrix} +obstr \\ +cont \end{bmatrix} \rightarrow [-voice] \quad / \quad [+obstr]$$

$$(b) \quad [+obstr] \rightarrow [+voice] \quad / \quad \begin{bmatrix} +voice \\ +obstr \\ -cont \end{bmatrix}$$

Although Bach does not provide data, these rules are intended, apparently, to account for the following cases:



- |     |     |                  |                |   |                 |
|-----|-----|------------------|----------------|---|-----------------|
| (v) | (a) | <i>zak-doeck</i> | 'handkerchief' | > | <i>zagdoeck</i> |
|     | (b) | <i>kas-boeck</i> | 'cash-book'    | > | <i>kazboek</i>  |
|     | (c) | <i>bos-viool</i> | 'hedge-violet' | > | <i>bosfiool</i> |

Unfortunately, however, statements (i) and (ii) are observationally inadequate in view of the fact that (i) a voiceless obstruent is capable of devoicing a voiced sister; and (ii) rightmost spirants are always voiceless and determine the voicelessness of the cluster. Examples:

- |      |     |                     |             |   |                    |
|------|-----|---------------------|-------------|---|--------------------|
| (vi) | (a) | <i>bloed-koraal</i> | 'red coral' | > | <i>bloetkoraal</i> |
|      | (b) | <i>hand-vat</i>     | 'handle'    | > | <i>hantfat</i>     |

While these additional phenomena could be handled by ordering an independent rule of word-final devoicing before the assimilation rule, as pointed out by Bach in a footnote, it is not clear that under this refinement an interesting neighborhood analysis can be maintained. Following an elaborate treatment in Mey (1968), the facts of voicing assimilation between obstruents in Dutch have been discussed in a number of papers, a survey of which can be found in Brink (1976). The same phenomenon has been used as an illustration of the so-called Duke of York Gambit in Pullum (1976), with uncertain theoretical consequences (cf. Hogg, 1978).

Secondly, Guile (1972) illustrates a purported universal claim about rules of epenthesis and syncope of vowels with an example from Dutch. The hypothesis is that:

- (vii) (a) rules of vowel epenthesis . . . always break up . . . a consonant cluster which contains at least one nonobstruent consonant as one of its constituents. . . Conversely, a rule of vowel epenthesis never breaks up exclusively obstruent clusters;
- (b) consonant clusters created by a rule of vowel syncope must include some sub-set of the non-obstruent clusters and conversely, no rule of vowel syncope creating consonant clusters creates exclusively obstruent clusters.

The illustration from Dutch pertains to the (a)-branch of this hypothesis, and is illustrated with examples such as:

- |        |               |          |              |         |
|--------|---------------|----------|--------------|---------|
| (viii) | <i>vinger</i> | 'finger' | <i>bezem</i> | 'broom' |
|        | <i>bitter</i> | 'bitter' | <i>Karel</i> | 'Carl'  |
|        | <i>kachel</i> | 'oven'   | <i>garen</i> | 'yarn'  |

For such cases Guile proposes the following formal rule:

- (ix)  $\emptyset \rightarrow \sigma$  /  $\left[ \begin{smallmatrix} V \\ +\text{stress} \end{smallmatrix} \right] C_1 \text{ — } \left[ \begin{smallmatrix} +\text{cons} \\ -\text{obstr} \end{smallmatrix} \right]$



Thirdly, the phenomenon of intervocalic *d*-weakening in Dutch, a traditional issue among the native students of that language, is used as an illustration of various theoretical mechanisms of generative phonology in Smith (1973), as the following conclusion shows:

Thus, what might seem to be a rather straightforward phonological process or processes has turned out to involve several interesting theoretical problems, to wit the treatment of exceptions, minor rules and redundancy, analogy, derivational constraints, including peeking and transderivational constraints (434).

Smith's paper launched a lively discussion reviewed in Zonneveld (1978). There the claim is made that the phenomenon is irrelevant to most of the issues mentioned by Smith, although it may be used as an illustration of some properties of the theory of exceptions in generative phonology. I will refrain from repeating the arguments here, and refer the interested reader to the last-mentioned work and references cited there.

Finally, Hyman (1978) used examples from Dutch as illustrations of the hypothesis that 'boundary changes represent a natural, recurring phenomenon in language, summarized as follows:

10.    ||   >   # #   >   #   >   +   >   Ø   ,

(gloss, from left to right: phrase boundary > full word boundary > internal word boundary > morpheme boundary > zero). The relevant passage runs as follows:

a new combination of the same morphemes may be introduced to contrast with an older, more fused one. Jan Kooij has discussed the differences between DUTCH *vruchteloos* 'fruitless' and *vruchtloos* 'fruit-less'. The first has a lexicalized meaning of 'in vain', while the second is literal and means 'without fruit'. The first pattern is older, carrying the genitive linker, while the second is newer, and for some examples, can be created on the spot. Thus, the word *harteloos* means 'heartless, without feeling' while a body found lacking a heart might be described as *hartloos*. The words with *-eloos* tend to be lexicalized with special meanings and are formalized with +, while those with plain *-loos* tend to be more literal and are formalized with #. (464)

In the light of the issue it is unfortunate that Hyman does not mention the examples which under one interpretation would bring out the difference in boundaries accompanying lexicalized and productive *-loos*: the

latter shows word-final devoicing as in *moedloos* 'without courage' where *d* is [t], vs. the former as in *moedeloos* 'dejected' where *d* is [d]. In the meantime, it is not clear from the recent discussion in *Phonologica* 1976 involving Booij (1977), Kooij (1977), and Zwicky (1977: 35) whether or not this example can be used in the way intended by Hyman.<sup>8</sup>

Outside these four instances, phenomena of Dutch phonology have been used as illustrations of smaller theoretical issues of generative phonology only sporadically. Brink (1974) uses various cases of interaction between rules of Dutch as examples and counterexamples to claims of historical phonology. One example is the interaction of rules of word-final devoicing and voicing assimilation of obstruents occurring in a variety of Indo-European languages, and for which Dutch is, presumably, as good an example as any. The point is that internal sandhi as in (va-b) makes word-final devoicing opaque by the definition of this notion in Kiparsky (1973). As Brink points out this is an unfortunate state of affairs.<sup>9</sup> The same two rules are used by Ralph (1974) in an argument against their formal collapsibility.

The study of Dutch dialects has resulted in three works which touch on issues of some theoretical import. First, Robinson (1975) (a revision of a chapter of his 1972 Ph. D. thesis) argues for a relatively concrete view in the abstractness debate in generative phonology after Kiparsky (1968), by following the history of an apparently morphologized rule of Umlaut in the Limburgic dialect area. The same rule functions as an example of the notion of 'scattered rule' in Robinson (1976). The research reported on in these works may be seen as a direct predecessor to the development of the theory of so-called 'upside-down phonology', presented for the first time in Leben and Robinson (1977).<sup>10</sup> Second, Zonneveld (1976) shows that the claim made in Anderson and Browne (1973) that so-called 'exchange rules' are limited to a (partly) morphological environment has a counterexample in the dialect of Flemish spoken in the Marollen area of Brussels up to the first third of this century. The analysis is put forward as support of Chomsky and Halle's (1968) synchronic account of the Vowel Shift in English. Third, Taeldeman (1977) argues, on the basis of intricate sets of data from Flemish, in favour of a moderate degree of phonological abstractness in terms of Kiparsky (1973), and intrinsic ordering of phonological rules.

Theoretical contributions to historical generative phonology have been made by Koefoed (1974) and Van Coetsem (1975). The former is a discussion of the notion of simplicity in relation to formal vs. functional constraints in language change. The discussion is taken up by Kipar-

sky (1974). The latter is a comment on the presumed difference between the role of simplicity in language acquisition by the child, and of complexity in the development of the adult grammar.

Finally, two large-scale works on the generative phonology of Dutch are the 1970 University of Wisconsin Ph. D. thesis by Brink: *Problems in Phonological Theory: a generative phonology of Dutch*, and the 1971 University of Texas at Austin Ph. D. thesis by Pulte: *An Outline of the Development of Dutch Phonology*. They do not, however, enter into any major theoretical controversy.

### Notes

<sup>1</sup> Translation by Wim Zonneveld.

<sup>2</sup> As pointed out correctly by Spa (1979: 5) many of these insights have been left unnoticed in a recent discussion on the role of the syllable in a generative phonology of Dutch.

<sup>3</sup> In general, it appears that in modern terms A.W. de Groot's represents a type of 'Concrete' or 'Natural' Structuralist Phonology. His ideas appear to be mirrored, for instance, by aspects of the 'full entry' theories of Stanley (1967), and Hooper (1977). Further research into this might prove worth the effort.

<sup>4</sup> A Dutch translation of the Address was published in *Onze Taaltuin* (1932).

<sup>5</sup> Translation taken from Schultink (1974: 24).

<sup>6</sup> Translation by W.Z.

<sup>7</sup> The same example is given in Harms (1968: 67).

<sup>8</sup> See also Kooij (1978).

<sup>9</sup> For the most recent treatment of this point cf. Tiersma (1979).

<sup>10</sup> See also Robinson's contribution to this volume on Dutch diminutives.

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# STRUCTURE CONDITIONS FOR INITIAL POSITION IN STANDARD DUTCH

DANIEL T. BRINK

## *1. Introduction*

Within the framework of generative phonology, a variety of rather different approaches have been proposed through the years for specifying the underlying phonological structures permitted in a language. The best known include Morpheme Structure Rules (Halle, 1959), Morpheme Structure Conditions (Stanley, 1967) and marking conventions (Chomsky and Halle, 1968). Of these, Stanley's Morpheme Structure Conditions have received the greatest degree of general acceptance, but have nevertheless not been widely employed for a variety of reasons, the most recent one being an increasing doubt among many linguists about the linguistic significance of the morpheme structure concept itself. The objection to traditional generative interest in the structure of *morphemes* derives from a belief in the greater significance of other structural domains: *words* and/or *syllables*.<sup>1</sup> As a result, a number of descriptive procedures have been developed outside of the traditional generative framework for describing such structures, including the phonological base (Sampson, 1970), Surface Structure Constraints (Shibatani, 1973) and Syllable Structure Conditions (Hooper, 1976).<sup>2</sup>

The controversy over which unit – morpheme, word, or syllable – is the proper domain for structural analysis is ultimately just another manifestation of the continuing debate between advocates of more abstract (systematic, generative, etc.) and more concrete (autonomous, phonemic, etc.) theories of phonology.<sup>3</sup> As such, this controversy is not likely soon to be clearly decided in favor of one side or the other. In the present study we wish to avoid this issue – dubbed the 'domain problem' by Kenstowicz and Kisseberth (1977, 145) – by limiting our analysis to the initial clusters of Standard Dutch, since syllable, word and (lexical) morpheme all show the same structural pattern in this position.<sup>4</sup> In this way we can work toward the development of a method of description which will be valid in any structural domain.

## 2. Conditions

The original method for expressing structural constraints in generative phonology was by means of rules (Halle, 1959). Since Stanley (1967), however, it has been generally recognized by phonologists of both abstract and concrete persuasions that structural generalizations should be *static* (conditions, constraints, base rules, etc.) rather than *dynamic* (morpheme structure rules). The appropriateness of static statements is argued in two ways: 1) limits on the length of a structural unit cannot be expressed by means of rules, but find a natural means of expression in Positive Conditions (see below); 2) co-occurrence restrictions often cannot be expressed by means of rules without *arbitrarily* selecting one element or set of specifications as the defining environment of the restriction; no such arbitrary selection is necessary when Negative Conditions (see below) are employed.<sup>5</sup>

The system to be used in this study is based on Stanley (1967). Stanley's system involved three types of static statements: Positive Conditions, Negative Conditions and If-then Conditions.

### 2.1. Positive Conditions

Briefly, Positive Conditions (PC's) state the patterns to which every structural unit of the language must conform. Even though Stanley expressed his PC's in terms of morphemes, he recognized that their function was to define the syllabic structure of a language. This was to be achieved by restricting their use to the expression of sequential constraints on major class feature specifications: [ $\pm$  consonantal], [ $\pm$  sonorant], [ $\pm$  syllabic] (Stanley, 1967, 427, 432).<sup>6</sup> Stanley's PC's are grouped into a single statement, the necessary flexibility achieved by means of parentheses, as in (1):

(1) + ([-son]) ([+son]) V

which states that, in initial position (that is, after the '+'), a vowel ('V') may be preceded by an obstruent ([-son]) segment, a sonorant ([+son]) segment, by both in sequence, or by neither.

For this study, the only revision of Stanley's version of the Positive Condition concept will be to *require* that all PC's be expressible in a single statement. (In Stanley's article the example of how the PC's of a language might be expressed *does* involve conflation into a single rule, but he does not say whether this must always be the case [1967, 427].) That is, we will say that there is only one PC for initial position in Dutch and the beginning of every structural unit of the language must satisfy it.

## 2.2. Negative Conditions

Negative Conditions (NC's), like the PC, are static descriptions, but they do not express what must be true of all structures of a language; rather, they express what *cannot* be true. Whereas the PC expresses generalizations only about sequential structure, NC's can be used in formalizing both sequential and segmental patterns (although only their use in the expression of sequential patterns will be made use of here).<sup>7</sup>

A simple NC for Dutch will demonstrate the usefulness of this device in avoiding arbitrary analyses. In Dutch formatives, no sequence of two identical non-syllabics is allowed. That is, there is no occurrence of \*/...ss.../, none of \*/...nn.../, and so on. The formalization of this constraint as an NC, given in (2), is straightforward:

$$(2) \quad \text{NC:} \quad \begin{bmatrix} -\text{syl} \\ \alpha\text{feat} \end{bmatrix} \quad \begin{bmatrix} -\text{syl} \\ -\alpha\text{feat} \end{bmatrix}$$

To express the same constraint by rule, however, some process would have to be devised (the alteration of one segment when preceded [or followed] by the other, coalescence into a single segment, etc.), and – from the point of view of underlying structure – any such process would be completely arbitrary. NC's will function in this study just as originally proposed by Stanley.

## 2.3. If-then Conditions

For those situations in which a set of specifications *could* be thought of as playing some defining, determinative role in a structural constraint, Stanley retained in his system a rule-like device, the If-then Condition: *if* X is true, *then* Y is also true (and further: if X is not true, *then* Y is not relevant and may be ignored [1967, 426]). Using Stanley's example, such a condition could be used to capture the fact that initial obstruent clusters in English consist of /s/ followed by a voiceless stop, as in (3):

$$(3) \quad \begin{array}{ll} \text{if:} & + \quad \begin{bmatrix} -\text{son} \end{bmatrix} \quad \begin{bmatrix} -\text{son} \end{bmatrix} \\ & \\ \text{then:} & \begin{bmatrix} +\text{ant} \\ +\text{cor} \\ -\text{voi} \\ +\text{cont} \\ +\text{stri} \end{bmatrix} \Downarrow \begin{bmatrix} -\text{voi} \\ -\text{cont} \end{bmatrix} \end{array}$$

A problem with the If-then Condition – a natural result of its rule-like character – is that analyses still tend to be arbitrary. For instance, another way of expressing the facts about initial obstruent clusters in English is to say that the segment which follows a [-ant], a [-cor], a [+voi], a [-cont], or a [-stri] obstruent is predictably [+son]; and so on. Ignoring the now-passé argument of economy, there is no principled way of choosing between these two analyses. To eliminate this problem, Stanley proposed that only PC's were to be used in expressing distributional generalizations for major class features (1967, 432). Under this proposal, the alternative set of rules given just above would be rejected, since generalizations about the distribution of the major class feature [ $\pm$ sonorant] are involved and these rules are If-then Conditions, not Positive Conditions. Since the 'then' part of (3) does not refer to a major class feature, by Stanley's principle it emerges non-arbitrarily as the proper way of expressing this particular generalization.

However, the proposal only eliminates arbitrariness in the case of English obstruent clusters; it is not a satisfactory general solution to the problem of arbitrariness in If-then Conditions. For instance, given a language with /kn/ as the only possible initial obstruent-nasal cluster, it would be possible to follow the 'spirit' of Stanley's approach, as in (4), but it would also be possible to use the series of conditions suggested by (5a) and (5b) to formalize the statement of this distribution. It is to be noted that in this case – as would be true in a host of similar situations – appeals to the special status of major class features are of no avail; the choice between (4) and (5) remains arbitrary:

- (4) If:        +    [ -son ]    [ +son ]  
                                $\Downarrow$         [ +nas ]  
       Then:        [ -ant ]    [ +cor ]  
                               -cor  
                               -voi  
                               -cont
- (5a) If:        +    [ -son ]    [ +son ]  
                               +ant  
                                $\Downarrow$   
       Then:                                [ -nas ]
- (5b) If:        +    [ -son ]    [ +son ]  
                               +voi  
                                $\Downarrow$   
       Then:                                [ -nas ]

In short, what is needed is a device with the characteristics of a PC but without the binding requirement that all structural units must satisfy the specifications of the condition. We will employ such a device – let it be called a Cluster Condition – in our analysis, assuming the following understanding of its function: a) it will have the same basic form and interpretation as a PC, except that b) there will be no requirement that the set of CC's be conflatable into a single statement (see §2.1.); further, c) structures will satisfy the requirements of the grammar as a whole if they satisfy *at least one* CC. For example, the language which permits only /kn/ as an initial obstruent-nasal cluster would contain – among others – the CC given in (6):

$$(6) \quad \text{CC:} \quad + \quad \begin{bmatrix} -\text{son} \\ -\text{ant} \\ -\text{cor} \\ -\text{voi} \\ -\text{cont} \end{bmatrix} \quad \begin{bmatrix} +\text{son} \\ +\text{cons} \\ +\text{cor} \\ +\text{nas} \end{bmatrix}$$

The set of possible underlying structures in a language will then be those which satisfy the PC, at least one CC, and no NC.

## 2.4 Phonological rules

Limited use will also be made in this study of phonological rules (P-rules). These rules will be of two types: a) segment adjustment rules, which alter the specifications of individual segments, deriving phonetically distinct surface forms from abstract underlying representations (such as [ŋ] from /n/ before velars, etc); and b) insertion rules, which create intrusive segments in the phonetic manifestation of transitions from one segment to another.<sup>8</sup>

## 3. The initial sequences of Standard Dutch

The segments and sequences which are possible in initial position are well known. Summaries of Dutch phonotactics include especially Cohen, *et al.* (1961), Oosterlynck (1962), and Van den Berg (1972). The reader is referred to these studies for examples and discussion of issues associated with these data.

### 3.1. Segment inventory

The phonetic inventory of non-syllabic sounds in Standard Dutch is listed in (7):

- (7) [p b f v t d s z k χ ɣ r l m n ŋ j w h]

It will be assumed that two of these segments, [h] and [ŋ], are not part of the underlying segment inventory. They will be derived by phonological rules, given in abbreviated form in (8) and (9):

- (8) /χ/ → [h] / + — V

(‘The voiceless velar fricative is weakened to [h] when it occurs in initial position before a vowel.’)

- (9) /n/ → [ŋ] / — velar

(‘Coronal nasals assimilate to following velars.’)<sup>9</sup> This arrangement reduces the inventory of underlying segments to the list given in (10):

- (10) / p b f v t d s z k χ ɣ r l m n j w/

### 3.2. The Positive Condition

We will use the term ‘initial sequence’ to mean those segments and sequences which may appear between an initial boundary (+) and the first [+syl] segment of the structure (V). The Positive Condition for Dutch must allow for initial sequences of from zero to three elements.

#### 3.2.1. Simple structures.

There are no special restrictions on initial sequences of ‘zero’ elements (that is, on vowel-initial structures); it is only necessary that the PC allow for this possibility by making initial [-syl] segments and clusters optional, as in (11):

- (11) PC: + ([-syl]) V

The list of underlying segments which appear in initial sequences of one element includes all and only the inventory of [-syl] segments given above in (10). Thus, no revision of (11) is necessary to provide for all initial sequences of one element.

#### 3.2.2. Initial clusters

The possible two and three segment initial sequences include (12) through (15):<sup>10</sup>

- (12) [-son] [+son] : *pr br fr vr tr dr kr χr*  
*pl bl fl vl kl χl*  
*pn fn kn χn*  
*tw dw kw*
- (13) /s/ [-son] : *sp sf st sk sχ*
- (14) /s/ [-son] [+son] : *spr str skr sχr*  
*spl skl*
- (15) /s/ [+son] : *sl sm sn sj sw*

### 3.3. Cluster Conditions

No further revision of the PC is necessary, since all occurring initial sequences of Dutch are encompassed by the possibilities formalized in (16). However, (16) does not constitute a complete description of the initial sequences of Dutch, since a number of sequences satisfy this condition which do not occur (*\*pm-*, *\*bn-*, *\*tl-* *\*sfr-*, etc.). What must now be done is to determine the set of CC's and NC's which will eliminate all those non-occurring combinations which satisfy (16). Four CC's will delimit much more precisely the set of actually occurring initial sequences.

### 3.3.1. Clusters ending in a liquid.

The liquids /r/ and /l/ have a much greater potential for clustering than do other sonorants. They combine with most of the obstruents (9 in all), and they combine with obstruent clusters to form 3-element initial sequences. These facts are captured in (17):<sup>12</sup>

- (17) CC:        +        /s/ [-son]     $\begin{bmatrix} +\text{son} \\ +\text{cons} \\ -\text{nas} \end{bmatrix}$  V

### 3.3.2. Clusters ending in /n/.

The only common initial nasal cluster is /kn/. However, the obstruents /p f χ/ do sometimes occur in combination with /n/, so a CC specifying all voiceless, non-coronal obstruents joined to the coronal nasal will be used.<sup>13</sup> (A more restrictive CC would also be possible, limiting nasal clusters to whichever combination of /pn/, /fn/, /kn/, and /χn/ seems most 'Dutch' to the analyst.) The maximally general CC is given in (18):

$$(18) \text{ CC:} \quad + \quad \begin{bmatrix} -\text{son} \\ -\text{cor} \\ -\text{voi} \end{bmatrix} \quad \begin{bmatrix} +\text{son} \\ +\text{cons} \\ +\text{cor} \\ +\text{nas} \end{bmatrix} \quad \text{V}$$

### 3.3.3. Clusters ending in /w/.

The segment /w/ combines with /k/, /t/, and /d/. (Phonetic [zw] from /sw/ is treated below.) These three obstruents constitute the set of non-anterior stops, making the CC formalized in (19) possible:

$$(19) \text{ CC:} \quad + \quad \begin{bmatrix} -\text{son} \\ -\text{ant} \\ -\text{cont} \end{bmatrix} \quad \begin{bmatrix} -\text{cons} \\ -\text{syl} \\ +\text{ant} \end{bmatrix} \quad \text{V}$$

### 3.3.4. Clusters beginning with /s/.

The segment /s/ has a far greater potential for clustering than do other obstruents. In addition to the fact that it combines rather freely with other obstruents and that it is always the first element in 3-element clusters, formalized above in §3.3.1., it can also combine with all [+son] consonants, a characteristic unique to this segment.<sup>14</sup> The CC for this class of clusters is given in (20):

$$(20) \text{ CC:} \quad + \quad /s/ \text{ [+son]} \quad \text{V}$$

Any initial sequence – even if it satisfies the PC – which does not satisfy at least one of these four CC's (that is, clusters in /m/ other than those with initial /s/, clusters in /w/ other than those with preceding non-anterior stops, etc.) will not be a possible underlying structure of the language.

## 3.4. Negative Conditions

The interaction of the PC in (16) and the CC's in (17) – (20) permits a total of 84 zero-to-three-element initial sequences, still quite a few more than the 55 sequences listed above in (10) and (12) – (15).<sup>15</sup> Negative Conditions will be employed to eliminate almost all of the remaining non-occurring clusters.

### 3.4.1. Voice agreement.

More than half of the 29 non-occurring initial sequences consist of sequences of /s/ followed by a voiced obstruent. However, in Dutch, the



specification for voicing is always the same for every member of an obstruent sequence, so that \*/sb/, \*/sv/, etc. – permitted by (16) and the CC's – can be eliminated by a general Negative Condition against sequences of obstruents with non-matching voice specifications, given in (21):<sup>16</sup>

$$(21) \text{ NC: } \begin{bmatrix} \text{-son} \\ \alpha \text{voi} \end{bmatrix} \quad \begin{bmatrix} \text{-son} \\ \text{-}\alpha \text{voi} \end{bmatrix}$$

### 3.4.2. The geminate consonant constraint.

Another problem resulting from the fact that our PC and CC's allow /s/ to be followed by any [-son] segment is that /s/ is thereby permitted to follow /s/. As discussed in §2.2., however, Dutch underlying structure never contains sequences of two identical [-syl] segments. The restriction, given above in (2), will be repeated here as (22):

$$(22) \text{ NC: } \begin{bmatrix} \text{-syl} \\ \alpha \text{feat} \end{bmatrix} \quad \begin{bmatrix} \text{-syl} \\ \alpha \text{feat} \end{bmatrix}$$

### 3.4.3. Non-labial fricatives.

Among non-labial fricatives there are no voicing contrasts in clusters (that is, both the /s/ : /z/ and the /χ/ : /g/ contrasts are lost). We will opt for an abstract analysis in dealing with this fact, assuming that the underlying segment is voiceless in both cases. In the case of /s/ and /z/, the choice of the voiceless member of the pair is motivated by the greater frequency of this segment in clusters (with [z] only occurring before [w]); for the velars, /χ/ is selected by virtue of its occurrence in other two-element clusters (/sχ-/), on the general grounds of symmetry, and especially because of the voiceless pronunciation of this segment so often heard in everyday speech. These abstract forms will, of course, necessitate P-rules, given in the next section. The NC is given in (23):

$$(23) \text{ NC: } + \begin{bmatrix} \text{-son} \\ \left\{ \begin{bmatrix} \text{-ant} \\ \text{+cor} \end{bmatrix} \right\} \\ \text{+voi} \\ \text{+cont} \end{bmatrix} \quad [-\text{syl}]$$

### 3.4.4. Alveolar stops before /l/.

Three of the remaining non-occurring sequences which satisfy the PC and CC's involve an alveolar stop (/t/, /d/) followed by /l/; in neither two- or three element clusters does this sequence occur, a limitation expressed in (24):

$$(24) \text{ NC: } + \begin{bmatrix} -\text{son} \\ +\text{cor} \\ -\text{cont} \end{bmatrix} \begin{bmatrix} +\text{son} \\ +\text{cons} \\ +\text{lat} \end{bmatrix}$$

### 3.4.5. Obstruent clusters before liquids.

The last NC required, (25), eliminates three-element sequences of /s/-fricative-liquid, which do not occur even though the CC in (17) and the PC must allow them because of /sf-/, /fl-/, etc.<sup>17</sup>

$$(25) \text{ NC: } + /s/ \begin{bmatrix} -\text{son} \\ +\text{cont} \end{bmatrix} \begin{bmatrix} -\text{syl} \end{bmatrix}$$

## 3.5. P-rules.

The five conditions given in §3.4. reduce the total number of clusters permitted to 55, exactly the total given above for (10) and (12)-(15). However, certain of these clusters do not have in underlying structure the precise phonetic specifications of surface forms; P-rules are therefore required to adjust these specifications. (Two such rules, the rule for weakening /χ/ to [h] and the rule for assimilating /n/ to following velars, were given above as (8) and (9).)

### 3.5.1. Palatalization of /s/.

The rare initial sequence /sj/ appears phonetically as [ʃ]. This rule, given in a transformational format in (26), appears frequently in extra-morphological contexts as well:<sup>18</sup>

$$(26) \quad \begin{array}{ccc} \begin{bmatrix} -\text{son} \\ +\text{cor} \\ -\text{voi} \\ +\text{cont} \end{bmatrix} & \begin{bmatrix} -\text{cons} \\ -\text{syl} \\ -\text{ant} \end{bmatrix} & \\ 1 & 2 & \Rightarrow 1 \quad \emptyset \\ & & [-\text{ant}] \end{array}$$

### 3.5.2. Voicing of /s/.

Initial underlying /s/ before /w/ appears phonetically as [z], the necessary rule formalized in (27):

$$(27) \quad \begin{bmatrix} -\text{son} \\ +\text{ant} \\ +\text{cor} \\ +\text{cont} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{voi} \end{bmatrix} / + \text{---} \begin{bmatrix} -\text{cons} \\ -\text{syl} \\ +\text{ant} \end{bmatrix}$$

## 3.5.3. Voicing of /χ/.

The CC's and NC's allow /χ/ and not /g/ to appear before /r, l, n/ (as discussed in §3.4.3.). Although there is some variation among speakers – with many retaining this velar as voiceless – the standard language calls for [g], giving rise to (28):

$$(28) \begin{bmatrix} -\text{son} \\ -\text{ant} \\ +\text{cont} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{voi} \end{bmatrix} / + \text{ — } \begin{bmatrix} +\text{son} \\ +\text{cons} \end{bmatrix}$$

## 3.5.4. Underlying /sr/ to [sʁ].

This rule is the only insertion rule employed in the analysis. Again there is some variation among speakers – with the underlying /sr/ retained phonetically by some –, but (29) gives the form called for in standard pronunciation:<sup>19</sup>

$$(29) \emptyset \rightarrow \begin{bmatrix} -\text{son} \\ -\text{ant} \\ -\text{cor} \\ -\text{voi} \\ +\text{cont} \end{bmatrix} / \begin{bmatrix} -\text{son} \\ +\text{ant} \\ +\text{cor} \\ +\text{cont} \end{bmatrix} \text{ — } \begin{bmatrix} +\text{son} \\ +\text{cons} \\ -\text{nas} \\ -\text{lat} \end{bmatrix}$$

## 4. Summary

The possible initial sequences of Dutch can be described efficiently by a combination of four distinct devices: a single Positive Condition, which defines the basic restrictions on what types of segments may occur; Cluster Conditions, which – like If-then Conditions – give more detailed specifications for various cluster categories, but without the arbitrariness inherent in If-then Conditions; Negative Conditions, which forbid impossible sequences; and P-rules which make the adjustments necessary in case of abstract analysis.

## Notes

<sup>1</sup> For a review of the issue and arguments, see Kenstowicz and Kisseberth (1977, Ch. 3).

<sup>2</sup> On Surface Structure Constraints, see also Clayton (1976); Hooper's work rests heavily on recent suggestions of Vennemann, as she frequently acknowledges in Hooper (1976).

<sup>3</sup> On this debate, see especially the sensible remarks in Darden (1974).

<sup>4</sup> Hooper (1976, 188) makes the important point that the necessity of restricting generalizations to *lexical* morphemes undercuts the traditional position and argues for her approach.

<sup>5</sup> The arguments come originally from Stanley (1967); they are repeated in Kentowicz and Kisseberth (1977; 152–4), although K&K use the arbitrary analysis argument as support for If-then Conditions, not Negative Conditions.

<sup>6</sup> In spite of Stanley's discussion of syllable structure, Hooper (1976, 191) is correct in stating that he used the morpheme as his basic structural unit. Essentially the same objection to morpheme-based analyses appears in Sampson (1970, 594, n 7). A system of PC's for onset and coda much like Sampson's phonological base – combined with something like Vennemann's (1972) Laws of Initials and Finals – would make it possible to develop a sort of 'underlying syllable structure,' probably the best 'traditionalist' response to Hooper's Syllable Structure Conditions and strength relations.

<sup>7</sup> As an example of the use of Negative Conditions in expressing segmental constraints, Dutch, which has /k/, /x/, /g/, but no /g/, will have an NC against segments which are [-son], [-ant], [-cor], [+voi], and [-cont].

<sup>8</sup> For a discussion of this type of rule, see Hooper (1976, Ch. 3). The only intrusion example I am aware of for Dutch initial clusters involves intrusive /t/ in /sr-/ sequences (*stroop*, from mlat. *s(i)ropus*, etc.); see Schönfeld (1970, 99).

<sup>9</sup> There are other phonetic segments in the inventory of Dutch sounds, such as [t'] and [t], which were not dealt with in (7) and (10), either because they are found only in 'exotic' vocabulary or because of a long tradition of treating them as underlying sequences; see the references cited in §3.

<sup>10</sup> There are exotic sequences left out of this summary, such as /fj-/, /ps-/, etc.; again: see the references in §3 for details.

<sup>11</sup> The PC in (16) continues to allow the same one-element initial sequences as were possible with (11): all [-syl] segments are either [-son] or [+son].

<sup>12</sup> Rather than use parentheses over and over, it will be assumed that structures need only satisfy all *or part* of some CC to be passed by the grammar.

<sup>13</sup> The /x<sub>n</sub>/ cluster is an abstract representation for [g<sub>n</sub>]; see §3.5.3.

<sup>14</sup> The two CC's involving /s/ could, of course, be joined into a single condition by using brackets.

<sup>15</sup> The number 55 includes 37 multiple-element initials, 17 one-element initial and one 'zero-element' initial.

<sup>16</sup> On voicing, see also Brink (1976), Tops (1974) and references cited there.

<sup>17</sup> One exception to this generalization, [sx<sub>r</sub>], is accounted for in §3.5.4.

<sup>18</sup> The palatalizing influence of /j/ on alveolars is pervasive in Dutch, operating even across word boundaries.

<sup>19</sup> On [sr] for standard [sx<sub>r</sub>]: Zwaardemaker and Eijkman (1928, 236).

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# WORD FREQUENCY AND LEXICAL DIFFUSION IN DIALECT BORROWING AND PHONOLOGICAL CHANGE

MARINEL GERRITSEN AND FRANK JANSEN

## *1. Introduction\**

For many years dialectologists have availed themselves of the concept of dialect borrowing in order to explain linguistic phenomena which cannot easily be brought into line with the other facts found in that dialect. In the past few years, however, the use of dialect borrowing as an explanatory device has met with (increasingly) vehement criticism. Chen (1972) has pointed out that dialect borrowing served traditionally as a label by means of which all kinds of exceptions to general laws could be shoven under the rug. He argues, and convincingly so, that dialect borrowing -in its definition until then- is useless as a scientific explanatory device since it can never be refuted: there is no theory which predicts when, where, and why one dialect will borrow from another, and when, where, and why the borrowing process will not take place. At the same time, Chen (1972) emphasizes the necessity of a theory of dialect borrowing for a theory of language change because of the existence of certain well-attested changes that apparently can only be explained by assuming a process of dialect borrowing.

The first step towards a definition of the concept of dialect borrowing has been described in Trudgill (1974). For this purpose Trudgill adopted a formula originating from social geographers who used it in order to investigate the interaction between two centres. This simple formula, which employs easily obtainable main factors such as distance and population number (see legend map f), was tested and refined by Trudgill in his survey of a Norwegian peninsula. With this formula, he succeeded in determining more accurately when it is plausible or implausible to regard

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certain phonological changes as the result of dialect borrowing.

Gerritsen and Jansen (in press) checked to what extent the predictions resulting from Trudgill's formula of dialect borrowing hold for the dialects spoken in the area of Amsterdam. On the basis of a diachronic, quantitative investigation in this area of the changes of standard [ɛɪ], it was examined where and when the Amsterdam variants [a.] and [ɛ.] had arisen. The main result of this investigation was that Trudgill's formula seemed to make the right predictions for the majority of towns and villages in North Holland, the province where Amsterdam is situated. In most cases where a great Amsterdam influence had been predicted, Amsterdam variants were indeed found; on the other hand, where the formula had predicted little or no Amsterdam influence, few to no Amsterdam variants were found.

Some of the exceptions to this pattern were dealt with in Gerritsen and Jansen (in press). This paper proposes a refinement of Trudgill's formula, partly in order to explain why Amsterdam variants had been found in spite of a low index for Amsterdam influence according to Trudgill's formula. It appeared that a sharp distinction would have to be made between the rise of Amsterdam variants due to *natural phonological change*, and the rise of Amsterdam variants due to *unnatural change*.

The distinction between natural and unnatural change was adopted from Labov, Yaeger, and Steiner (1972), who reported on certain tendencies which they label 'principles of sound changes'. These principles are based on ongoing sound changes recently observed in sociolinguistic surveys by comparison of spectrograms made of vowels in the casual speech of different generations within one speech community, and by comparison of the vowel spectrograms of the casual speech of dialect informants speaking closely related dialects. The tendencies found time and again were confirmed by the philological evidence of sound changes in previous stages in various languages.

We will call a sound change which develops according to the Labovian principles of sound change a 'natural change', and those which do not, 'unnatural changes'. Naturally, the former take place with far greater ease than unnatural changes, since one has to assume in the latter case that the dialect variant is *replaced* by a variant from another dialect. As a follow-up to Gerritsen and Jansen (in press), this paper will deal with the relation between word frequency on the one hand, and natural and unnatural changes towards Amsterdam variants on the other. This investigation was carried out in the same dialect area, and with the same data of standard [ɛɪ] from West-Germanic *î*.

## 2. Some problems in the relation between lexical diffusion, word frequency, and sound change

This section will deal with some reflections on the relation between lexical diffusion on the one hand, and natural and unnatural change (dialect borrowing) on the other. First we will determine whether word frequency can be regarded at all as an explanation of certain facts of lexical diffusion. After that, we will go into the -theoretically possible- relation between word frequency and natural and unnatural change.

The basic tenet of the theory of lexical diffusion as discussed in, for example, Chen (1972), Chen and Wang (1975), and Wang and Cheng (1970) is the *gradual* spread of a new sound variant through the lexicon. A sound change does not affect all words with a particular sound in the lexicon of a dialect at the same time. Some words adopt the new variant at a relatively early point in time; subsequently the bulk of the lexicon adopts the new variant, and very often a rest group of lexical items with the original sound variant survives for quite a long time.

The pattern of this process observed by Wang and Cheng (1970) in the Shuang-fēng dialects is illustrated in Fig. 1.

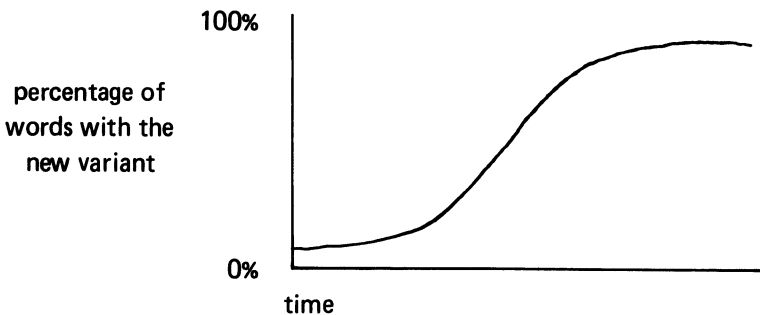


Figure 1.

As far as we know, none of the papers mentioned above states a connection between lexical diffusion and word frequency. However, it does not seem implausible that a relation does indeed exist between the frequency of a lexical item with a particular phonological variant, and the rate at which this variant changes into another variant.

This suggestion, however, is more complicated than one might think. For, supposing that this relation does indeed exist, it is not at all certain whether this relation will be the same for both kinds of change, natural and unnatural (cf. section 2.1.), and for all kinds of lexical items with the same frequency (cf. section 2.2.).



### *2.1. The relation between word frequency and unnatural and natural changes.*

One of the findings of Gerritsen and Jansen (in press) was that two kinds of changes of standard [ɛt] towards the Amsterdam variants will have to be distinguished.

- (i) Dialects in which the Amsterdam variants could only have arisen as a result of unnatural change. In this case the only possible explanation of the rise of the Amsterdam variants is dialect borrowing.
- (ii) Dialects in which the Amsterdam variants could only have arisen as a result of spontaneous (i.e. natural) change. In this case dialect borrowing need not be the only explanation of the rise of Amsterdam variants.

Assuming that this distinction between natural and unnatural changes is correct, several hypotheses can be made with regard to the relation between word frequency and these two kinds of changes.

#### *2.1.1. The relation between word frequency and attested dialect borrowing.*

In the case of unnatural change, i.e. dialect borrowing, the following is to be expected. High frequency means that a word is often uttered, and consequently often heard. When people from Amsterdam consistently use the Amsterdam phonological variants in all words when speaking to dialect speakers, the latter are quite likely to hear the same frequent words with the Amsterdam variants, but far more rarely the less frequent words with the Amsterdam variants. In all probability, dialect speakers will hear and recognize the Amsterdam variants first in highly frequent words. It is acceptable, therefore, to assume that in the subsequent process of unconscious imitation of the new variant, the dialect speaker will use Amsterdam variants first and foremost in the words he frequently heard pronounced with the Amsterdam variants, thus in highly frequent words. This seems to be a sound reason for positing the following hypothesis:

Hypothesis I: In dialects with an attested Amsterdam influence, i.e. an Amsterdam influence brought about by unnatural change, highly frequent words will develop towards the Amsterdam variant at a higher rate than less frequent words.

From another point of view, i.e. to explain the extremely conservative character of words in the domestic lexical field, dialectologically oriented germanists have presented specific hypotheses on the types of words that will never or only very reluctantly borrow a certain phonological variant, cf. Kloeke (1927), Janssen (1941), Schirmunski (1962), and, more recently, Weijnen (1969). They all endorse the hypothesis that frequent words are the first to borrow a certain phonological variant. However, they disagree as to the most relevant speech event for the borrowing of a certain phonological variant, for instance the frequency of words spoken at the market or the frequency of words spoken in the family. Weijnen (1969) reviews the relevant literature on this topic, and demonstrates how the various hypotheses can be tested.

Since the contributors to this discussion concentrate on the explanation of the conservative character of words, they are particularly interested in the state of the lexicon as represented in the rightmost phase of Fig. 1: the words that resisted a certain sound change and retained a conservative sound. The investigation laid down in this paper, however, is directed towards the leftmost phase of Fig. 1: the words that are the first to change into the new variants. That is why this paper will not delve into the delicate distinctions between words frequencies in various kinds of speech events, which the above mentioned germanists have made, although these distinctions seem to be correct and insightful as such.

### *2.1.2. The relation between word frequency and natural change.*

In the case of natural, spontaneous change, it is necessary to make a distinction between reductions and other, non-reduction, changes. First we shall dwell on reductive processes; after that, we shall go into the other kinds of changes.

The process of reduction can be defined as an intermediary stage in the complete disappearance of a phonological element; for example *konijn* 'rabbit' can be pronounced [konɛin], [kənɛin], [k<sup>ə</sup>nɛin], and [knɛin]. A necessary condition for the reduction of an element is the absence of any stress on that element. It is reasonable to regard the process of reduction as motivated by the 'ease of articulation' factor. Furthermore, it is quite reasonable to hypothesize that reduction proceeds faster in frequent words. Notes on this phenomenon are found quite early in the relevant literature, for instance Schuchardt (1885); the hypothesis is tested and justified in Fidelholtz (1975), and in Hooper's extremely interesting

1976 paper. Since we have not explored reductions in the area of Amsterdam, we shall not go into greater detail here.

Processes other than reduction, however, are not so easily explained by the 'ease of articulation' factor, and occur preferably in stressed elements. One of these processes is *strengthening*. The term strengthening is used to define the tensing and raising of vowels. Labov (1974: 253) observed a strengthening process in the City of New York, and expressed it in spectrograms that showed that this vowel change cannot be put on a par with reductions: speakers use no less energy for the production of a tensed and raised vowel than for a lax, low vowel. Furthermore, Labov found that the strengthening process is most advanced in stressed or emphatically uttered lexical items.

As far as we know, little has been said in the relevant literature until now about strengthening processes. We would like to point out that the natural change from  $[\varepsilon\iota]$  to  $[\varepsilon_{\tau}]$  and especially  $[\alpha\iota]$  to  $[a:]$  in the North-Hollandic dialects is part of a strengthening process, in spite of the fact that the glide element of the diphthong has disappeared, which could be regarded as resulting from reduction. There appear to be four arguments in favor of the claim that we are dealing here with a strengthening process:

- (i) In both cases the vowel-like element is lengthened: we never came across  $*[f\varepsilon n]$  or  $*[fan]$  (standard *fijn* 'fine'), but always  $[f\varepsilon_{\tau}:n]$  and  $[fa:n]$ . As for the  $[a:]$  variant, we must also assume tensing besides lengthening: there is no dialect where  $[f\alpha in]$  has changed into  $[f\alpha.n]$ .
- (ii) The common reduction which monophthongizes diphthongs is the absorption of the glide element by a following consonant (Stampe 1972: 549). One would expect, therefore, that the  $[\varepsilon_{\tau}]$  and  $[a:]$  variants occur only in the phonetic environment of a following consonant. However, these long monophthongs show up in word-final position as well, for instance in  $[bla:]$  (standard *blij* 'glad'), and (ik)  $[r\varepsilon_{\tau}]$  (standard *rijd* 'I drive').
- (iii)  $[\varepsilon_{\tau}]$  and  $[a:]$  are not conditioned by absence of stress. On the contrary, these variants occur preferably in stressed syllables in the recordings of our informants.
- (iv) In a few dialects a second variant is found, i.e.  $[\ae.^{\circ}]$ . Here, the glide has weakened to the neutral shwa. This may be a phase in a reduction process, but, as we would like to point out again: this reduction is limited to the glide element of the diphthong. In this case, too, the

vowel element of the diphthong is lengthened and tensed at the same time.<sup>1</sup>

Having presented arguments for considering the North-Hollandic vowel change a process of strengthening, we now confront the question as to whether it is possible to make a hypothesis -also on a priori grounds- on the relation between frequency and strengthening processes. In our opinion, one can reason from two angles, one depending largely on phonetics, the other depending largely on sociolinguistics. These two ways of reasoning each lead to another hypothesis. The resulting two hypotheses are each other's exact antipodes!

2.1.2.1. First we will pursue the phonetic line of thought. There appears to be a relation between stress and reduction which can be described as follows: the rapid reduction of a speech element is conditioned by the absence of stress on that element. Another condition is the high frequency of the lexical item in which the element occurs. These two relationships can be explained by the fact that reduction, like other processes that are caused by the 'ease of articulation' factor, has a greater opportunity to operate in frequent items, since they are more often pronounced.

Secondly, reductions cause indistinctness of lexical items, for example, the group *als je hem* 'if you . . . him' is mostly reduced in speech to [ɑjənəm]. Reductions like this one are more acceptable in frequent items than in infrequent ones, as it is easier for a listener to understand indistinct words which he hears every minute, than indistinct ones which he never or only very seldom hears.

The relation between on the one hand the monophthongizations that are the subject of this paper, and stress and frequency on the other, is quite another matter. Firstly, it has been pointed out above that strengthening is more advanced in stressed syllables. Secondly, the result of the process is not an indistinct lexical item; for example, [bla.] and [blei] 'glad' differ in pronunciation, but the former variant is by no means less intelligible than the latter.

These two differences between strengthening on the one hand, and reduction on the other, lead one to the hypothesis that this process of monophthongization will take place sooner in infrequent words. The rationale behind this hypothesis is that a speaker emphasizes a lexical item in order to direct the listener's attention to that item, arguing (correctly or incorrectly) that the information contained in the item is not expected by the listener. We assume that infrequent words have a greater

chance of being selected in circumstances of unexpected information than normal, frequent words, for the same reason that frequent lexical items are *more* expected, as has been observed above.

Furthermore, our process of strengthening is not hampered by a lack of distinctness, which would be strongest in infrequent words. Therefore we can set up Hypothesis II as follows:

Hypothesis II: The most radical strengthening changes take place in lexical items with a low frequency.

2.1.2.2. Regarding the spread of strengthening from a sociolinguistic point of view, the hypothesis on the relation between word frequency and strengthening works quite the opposite way.

The implementation of a natural, spontaneous change in a speech community is a complex interaction of changes in the articulation of the phonological variant in the speech of members of a speech community, and the interpretation of these changes by other subgroups of that speech community. Since interpretation of the new variants is involved, one may assume that first the most frequent words will lend themselves to interpretation and imitation, for the same reasons mentioned above in the case of unnatural change, i.e. dialect borrowing. This leads one to Hypothesis III, which is in several ways similar to Hypothesis I:

Hypothesis IIIa: The most radical strengthening processes take place in lexical items with a high frequency.

Or, more generally:

Hypothesis III: Natural sound changes take place first in lexical items with a high frequency.

If Hypotheses I and III should be proved right, this would imply that there is no need for a strict distinction between natural and unnatural change with regard to the relation between word frequency and sound change.

Surprisingly, no literature seems to exist with specific claims regarding the relation between non-reductive phonological changes (especially strengthening), phonological changes and word frequency. Apparently the reason why is that most linguists give a few examples of reductive changes, and in their conclusions subsequently generalize for all types

of changes (cf. Schuchardt (1885), Weijnen (1969)), thereby implicitly adhering to Hypothesis III. The only positive exception is Joan Hooper (1976), who explicitly limits her conclusions to reduction processes.

## *2.2. Distinctions within groups of lexical items with the same frequency.*

With regard to the relation between word frequency and language change, a distinction is often made between highly frequent words and infrequent words. The idea behind this is that all frequent words, such as *nous*, pronouns, verbs, etc., behave in one and the same way. In that case the following hypothesis can be set up, which will have to be borne out by the facts:

Hypothesis IV: The phonological variant changes in the same way in words with the same frequency.

However, it seems more reasonable -certainly for Dutch- to make a further subdivision of the class of frequent words, i.e. a division into pronominal and non-pronominal words.

The reason behind this subdivision is the fact that the personal pronouns which were the subject of this investigation share one important characteristic which other forms do not have. Since the preferred position of pronouns in Dutch sentences is immediately behind the first constituent that receives stress, and the referential function is rather dependent compared to words with a lexical content, the attention paid by the speaker to his pronunciation of pronouns is less than the attention directed to the pronunciation of non-pronominal forms.

Until now, non-reductive changes of pronominal forms have been relatively under-explored. The only exception is Schirmunski (1956), who observes the spread of new phonological variants in the class of function words (all pronominal forms, prepositions, and modal verbs), and concludes that this class is conservative in character.

In Jansen (1975) it has been demonstrated that the phonological variants in pronouns are to a far lesser degree subject to style shift than non-pronouns. This appears to be another argument in favor of the assumption that pronouns show a more conservative pattern in changes towards the Amsterdam variant.

Hypothesis V: The class of pronouns will either change not at all, or in a very small degree, regardless of whether the change is natural or unnatural.

All hypotheses mentioned in this section and to be investigated in this paper have been summarized in Table 1.

*Table 1.*

	fast	slow
unnatural change or dialect borrowing	all frequent words (Hyp. I, IV) all frequent words except pronouns (Hyp. V)	all infrequent words (Hyp. I, II) pronouns (Hyp. V)
natural change, strengthening	all frequent words (Hyp. III, IV) all infrequent words (Hyp. II) all frequent words except pronouns (Hyp. V)	all infrequent words (Hyp. III, IV) all frequent words (Hyp. II) pronouns (Hyp. V)

### *3. The collection of data*

The data which are the basis of this investigation were collected in the same way as in Gerritsen and Jansen (in press). The area under investigation, Amsterdam and its surroundings, was covered with a hexagonal grid (cf. Map 1). The cross section of each hexagon was approximately 5 kilometres (3 miles). The next step was to find a town or village in each grid for which data from two different points in time were available, i.e. from the following sources:<sup>2</sup>

- (i) Appr. 1950; the recorded sentences of the Reeks Nederlandse Dialect Atlassen (RNDA, Dutch Dialect Atlas Series) of North Holland (Daan 1969), and part of the volume of South Holland (Van Ooyen 1968);
- (ii) Appr. 1970; recordings of casual speech (along the lines of Labov, Yaeger and Steiner (1972)) of dialect speakers, made by the authors and other staff members of the Institute of Dialectology in Amsterdam.





This paper will only be occupied with the reflexes of West-Germanic *î*, which is realized as [ɛɪ] in current Standard Dutch. As explained above, one of the purposes of this paper is to examine whether there is a relation between the frequency of words and the change of a sound towards the Amsterdam variant. In order to investigate this, we made a distinction between

- (i) highly frequent, non-pronominal words with West-Germanic *î*;
- (ii) pronouns with West-Germanic *î*;
- (iii) non-frequent words with West-Germanic *î*.

These three categories will be briefly discussed below.

*ad (i):*

Highly frequent, non-pronominal words, i.e. words that score 40 or higher in the frequency list of words in Spoken Dutch (Uit den Boogaart 1975) which is based on 55,725 tokens, taken from the speech of dialect speakers. The score of 40 was taken as the breaking-point for the following reason: besides the frequency list of Dutch words spoken by dialect speakers, there is another frequency list of spoken Dutch. This list, however, is based on the speech of speakers of Standard Dutch (Uit den Boogaart 1975). A comparison of these two lists showed that the *ij* - words with scores exceeding 40 in the corpus of dialect speakers were identical with the most frequent *ij* - words in the corpus of speakers of Standard Dutch. Differences between the two frequency lists regarding the *ij* - words did not show until frequencies below 40. This appeared to be a sound reason for taking 40 as the breaking-point.

*ad (ii):*

All pronouns with [ɛɪ] belong to the class of highly frequent words. In this investigation, this class was limited to the pronouns *hij* 'he', *zij* 'she' and 'they', and *wij* 'we'. The latter two have reduced counterparts, *zə* and *wə*, respectively, which were left out of consideration. The same holds for all forms of *jij* 'you', the non-formal second person singular, more or less comparable with *du* in German, and *tu* in French. The reason for doing so was that the data at hand revealed that *jij* could not be bracketed together with the other pronouns with respect to [ɛɪ], as *jij* occurred almost exclusively, and considerably more often with standard [ɛɪ] than *hij*, *wij* and *zij*.<sup>3</sup>

*ad (iii):*

Those words were regarded as non-frequent words which had a frequency of 8 or less in Uit den Boogaarts's (1975) list. The choice of 8 as the breaking-point was made on purely arbitrary grounds. Gut-feeling told us that words with a frequency of 8 in the corpus on which the list was based, could be interpreted as having a low frequency in Dutch.

After checking which words in the RNDA and the recordings belonged to the class of pronouns, which to the class of frequent, and infrequent words, we determined the amount of Amsterdam variants per grid, per class (pronouns, frequent, and infrequent words) at each point in time. Table 2 shows how many words of each class occurred in the RNDA. It is a matter of course that we cannot state the exact number of occurrences of the three classes of words with West-Germanic *i* in the recordings, as this number varies for each grid.

Table 2.

	frequent words (40+)	pronouns	infrequent words (8-)
RNDA	4	31	11

The occurrence of Amsterdam variants per grid, per class at each point in time was counted, and with the help of the 'formula' as expressed in Fig. 2, the percentage of Amsterdam variants per grid was computed.

Fig. 2.

$$\% \text{ of Amsterdam variants in G, P, W} = \frac{\text{number of Amsterdam variants in G, P, and W}}{\text{total number of } ij\text{-words in G, P, and W}}$$

Where G = grid, P = point in time, and W = class of words

Our next step was to examine by comparison of the two points in time per grid per class of words whether or not Amsterdam variants had arisen. In those grids where Amsterdam variants were found, we examined whether this change towards an Amsterdam variant had been the result of a natural or an unnatural change.

The definition of a natural change towards an Amsterdam variant was relatively easy, i.e. [ $\varepsilon\tau$ ] in the first stage becomes [ $\varepsilon\tau$ ] in the second stage, or [ $\alpha\iota$ ] in the first stage becomes [ $\alpha$ ] in the second.

The unnatural changes, however, were measured by different standards, i.e.

- (i) the occurrence of an Amsterdam variant [ $\varepsilon_{\tau}$ ] or [a.] at a point in time, while there are no Amsterdam variants at a previous point in time, nor diphthongs [ $\varepsilon_{\tau}.\iota$ ] and [ $\alpha\iota$ ] which might develop into Amsterdam variants through natural change.
- (ii) The existence of Amsterdam variants, while there was at a previous point in time a minimal percentage of diphthongs apt to change naturally into Amsterdam variants, as compared to the percentage of Amsterdam variants at the next point in time.

Since we were well aware of the fact that errors and mistakes can easily crop up when applying the method used for the collection of the data and the calculation of the percentage of Amsterdam variants, we initially only investigated the increase in the percentages of Amsterdam variants between the two points in time, which seemed high enough to warrant the assumption that this increase could not be coincidental. *In concreto* this means that we only considered increases of 25% or more. With a view to the number of words per class in the RNDA phase, and the often even much higher number of words in the recording phase, this implied that we only considered those changes towards Amsterdam variants that had adopted at least six more words of a particular class in the Amsterdam variant than in the first phase, as such a difference could no longer be regarded as a coincidence.

#### 4. Results

A comparison of maps 2, 3, and 4 will show that all three display a different pattern. It is possible to set up a kind of implicational scale: all dialects with pronominal variants changing to Amsterdam [a.] or [ $\varepsilon_{\tau}$ ] have changed throughout their lexicons; all frequent and infrequent words have an Amsterdam variant, too. All dialects with infrequent words changing to the Amsterdam variants have Amsterdam variants in their frequent words, too (see pp. 45-7).

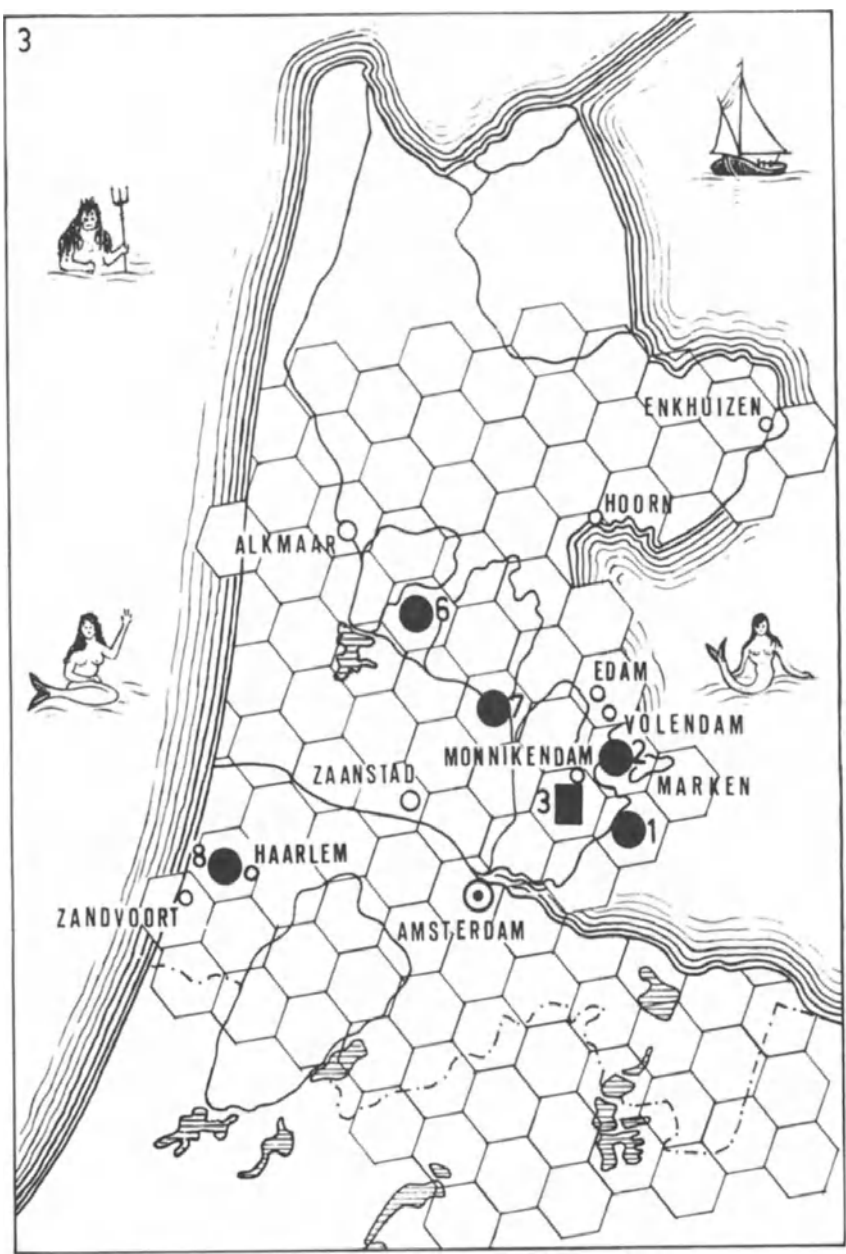
The only exception to this pattern is grid 3. This grid was all the more interesting to us as a counterexample to a number of general claims. However, it can be proved with the help of the questionnaire of the Dutch Geographic Society (cf. note 2), that the non-pronominal words had changed towards the Amsterdam variants at an earlier point in time.

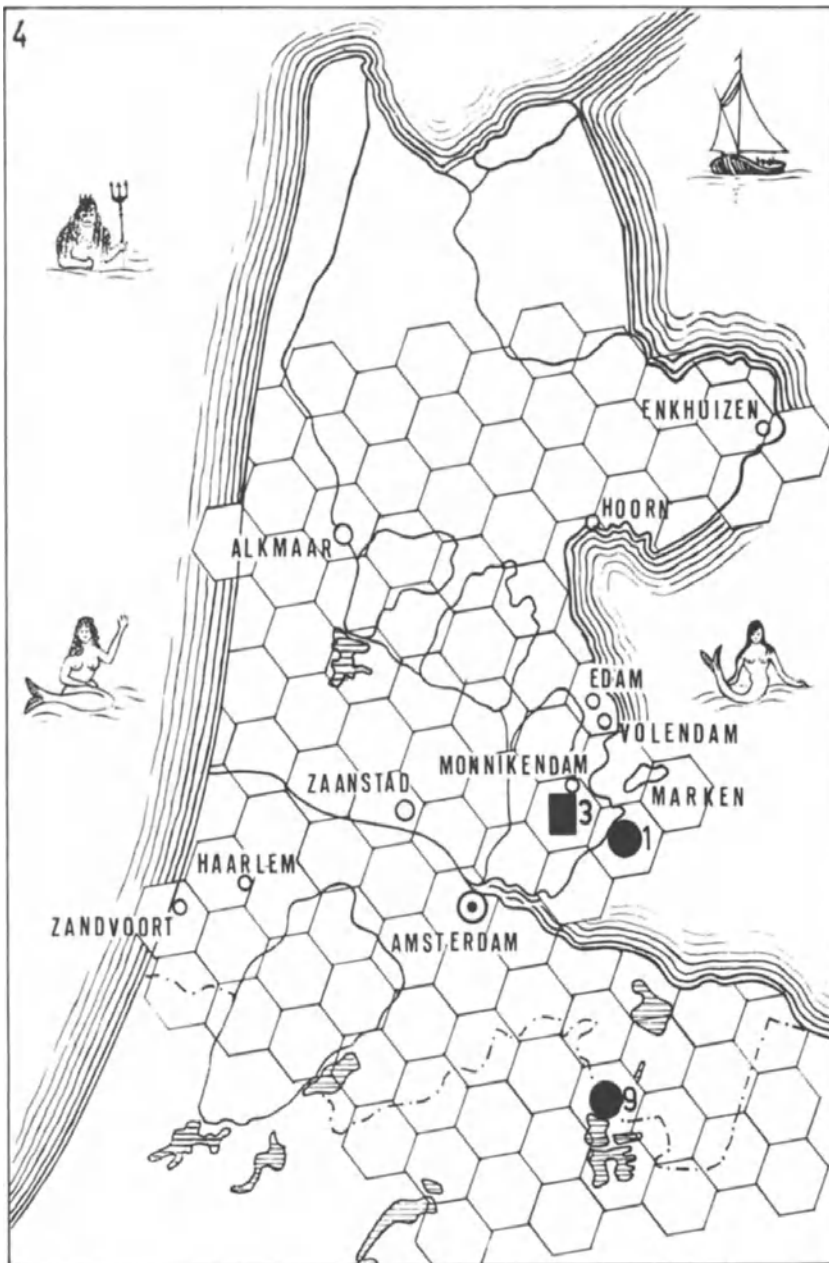


Increase of Amsterdam variants for 25 persons or more.

● = natural change.

■ = unnatural change.





Therefore this grid was a precocious one, and in the period under regard in this paper, it appears to have taken the final step towards the Amsterdam [a.] and [ɛɾ.] throughout the lexicon by changing its pronouns towards the Amsterdam variants.

## 5. Discussion

In this section we will discuss the data presented on the maps. The first section, 5.1, will deal with the possible alternative explanations of the patterns shown by the maps.

### 5.1. *The possible alternative explanations of the patterns shown on the maps.*

There may be several alternative explanations of the differences in the geographical diffusion of Amsterdam variants in pronouns, frequent, and infrequent words. The only two differences we were more or less able to check were (i) phonetic environment, and (ii) accentuation.

#### *ad (i):*

From a theoretical point of view, the role of phonetic conditioning by a preceding or a following segment is rather opaque, at least for the process of monophthongization. The following hierarchy has been proposed of phonetic environments with a positive influence on the development of Modern Dutch rising diphthongs originating from high tensed vowels:<sup>4</sup>

before a word boundary > before an alveolar consonant > before a velar or labial consonant (Leenen 1930, Hoppenbrouwers 1971):

It may be possible to assume the same hierarchy of conditioning factors for monophthongization, albeit the other way around. The only possible way to test this hypothesis was through *ij*-words in the RNDA because of the homogeneous character of the lexical items in all grids. The RNDA material was divided into three groups:

- (i) words with *ij* immediately followed by a word boundary;
- (ii) words with *ij* before alveolar consonants;
- (iii) words with *ij* before all non-alveolar consonants.

We subsequently counted the identical phonetic variants of each of these

classes in all grids. The differences between the numbers of identical variants did not reach a significant level when tested with a  $X^2$  test.

In the phase of the dialect recordings, the problems were more serious because among the most frequent non-pronominal words in the recordings those with an unfavorable position for diphthongization, i.e. *krijgen* 'to get', *blijven* 'to stay', *kijken* 'to look', and *vijs* 'five', outnumbered the words with a favorable position for diphthongization, i.e. *tijd* 'time', and *altijd* 'always'.<sup>5</sup> In other words, the lexical items with a possibly favorable condition on monophthongization are the majority in the class of frequent words in this phase.

An attempt was made to trace the dialects where the evidence for the existence of Amsterdam variants in the class of frequent words was based on the words with *ij* before a labial or velar consonant, i.e. a favorable position for monophthongization. In these dialects extra attention was paid to the class of infrequent words in order to find infrequent words with *ij* in the same favorable position. The intention behind this was to get a well-balanced idea of what was going on in those dialects. However, no cases were found that would oblige one to assume phonetic conditioning as the exclusive explanation. The one exception might be grid nr. 7 which shows a rule deleting the glide element for all consonants. It appears, then, that Schuchardt (1885: 57) was right in warning against the over-estimation of phonetic conditioning.

*Ad (ii):*

The fact that rising diphthongs originate from tensed vowels is closely related to the process of accentuation. Schmitt (1931) gives a fairly accurate account of the stimulating effect of, predominantly, pitch on diphthongization. Note, however, that the subject of this paper is not diphthongization, but a special kind of monophthongization. As far as we know, the relation of this process to accentuation is not as firmly established as in the case of diphthongization. We were not able to incorporate pitch as a possible conditioning factor in our investigation because of the scant information about this factor contained in the source of the first phase of our investigation, the RNDA. The obvious conclusion is that this conditioning factor, which positively plays a role of some kind in related processes, should be explored in a separate investigation.

The conclusion to be drawn from this section is that the existence of conditioning factors of lexical diffusion is dubious at best, or remains to be demonstrated.



*5.2. Discussion of the hypotheses.*

Some of the hypotheses set up in section 2 can be refuted by a single glance at the maps. Hypothesis IV is false: pronouns are reluctant to shift to the Amsterdam variant, thereby confirming Hypothesis V. Perhaps the fact that most personal pronouns are rarely stressed has influenced the cases of strengthening by monophthongization discussed in this paper. In order to find out whether or not pronominal forms are conservative in general (particularly in non-reductive processes), it is necessary to investigate the situation in other dialects, for example dialects where the process of diphthongization has just started.

Hypothesis II is false: grids 5 and 10 show a low value for influence (cf. map 1), and change naturally towards the Amsterdam variants, so one may assume a real natural change. However, only the diphthongs in frequent words have changed. There are no grids with a low value for influence in which only non-frequent words have changed. In other words, Hypothesis III appears to be correct. So Hooper's (1976: 98) guess that 'all sound changes, even those that we do not consider to be reductive, take place first in frequent words' is confirmed.

A consequence of the superiority of Hypothesis III over Hypothesis II is that the sociolinguistic way of reasoning (which led us to Hypothesis III) is superior to the purely phonetic argument that led to Hypothesis II.

The most obvious hypothesis, I, is supported by the most dubious facts, which is regrettable, but cannot be helped. The reason for this is that there were very few (only three) grids with unnatural changes, and one of these, nr. 3, has Amsterdam variants throughout the lexicon.

Grid 7 is a clear case of a dialect with attested Amsterdam influence in frequent words only. In grid 2 the situation is rather more complex: non-frequent words show the rise of Amsterdam variants through natural change, but the diphthong in frequent words is replaced by the Amsterdam variant by means of an unnatural change! Therefore these changes do not seem to contradict Hypothesis I because the changes in this dialect prove that the Amsterdam influence is more powerful in frequent words. A dialect showing the opposite situation (i.e. natural changes in frequent words and unnatural changes in infrequent words) would have been a true refutation of Hypothesis I, but no such dialect was found. Another case that might have been regarded as evidence against Hypothesis I, i.e. dialect variants in frequent words, and Amsterdam variants brought about by unnatural change in infrequent words, was not found either. Thus, Hypothesis I has stood its ground.

Finally, Map 5 is worth looking at, as it depicts all changes towards the Amsterdam variants which failed to reach the level of 25% or more.



Increase of Amsterdam variants for 25 persons or less.

- = high frequency.
- = low frequency.
- ▲ = pronouns.
- \* = only in some forms of *krijgen* 'to get'.
- \*\* = in all forms of *krijgen* 'to get'.

One comes across a great number of these 'sporadic' changes in frequent words. A comparison of the results for the other two categories, pronominal forms and the non-frequent words with the same pattern as in Map 2 will reveal that in many grids a change of less than 25% in pronominal forms and infrequent words is complemented by a change of more than 25% in the category of frequent words, that is, in grids 2, 5, 7, and 8. Therefore it is reasonable to claim that Map 5 provides further evidence for the vanguard character of frequent words in all kinds of changes (see p. 51).

The most interesting grids on Map 5 are the ones marked \*. These grids only show an Amsterdam variant in one or more forms of the paradigm of the frequent verb *krijgen* 'to get'. Apparently the situation is as follows. Whenever a grid showed Amsterdam variants and a form of the *krijgen* paradigm was used in the speech of the dialect speakers, the *krijgen* form assumed the Amsterdam variant (with the exception of grid 12). This fact seems to be linked with another feature of the verb *krijgen*: according to the frequency list of words in spoken Dutch (Uit den Boogaart 1975), *krijgen* is the most frequent non-pronominal form in spoken Dutch. It has a frequency of 148, whereas other non-pronominal words with frequencies of more than 40 have a far lower frequency, cf. *tijd* 'time' (56), *vijf* 'five' (99).

The example of *krijgen* seems to be a clear indication of the role of word frequency in lexical diffusion. The following general statement seems to be proved by our data:

The more frequent a non-pronominal form, the higher the rate of change, regardless of the kind of linguistic change.

Amsterdam, April 1978.

### Notes

<sup>1</sup> In pronouns and other words that often bear no stress, we heard variants of [αɪ] and [ɛɾɪ] which can only be explained as reductions, for example [hα] *hij* 'he' [bɛɾ] *bij* 'with'. These monophthongs are short and lax, and never occur if the lexical items are stressed. Evidence for the relation between the two kinds monophthongization on the one hand, and stress on the other in a North-Hollandic dialect, can be found in Jansen (1975).

<sup>2</sup> The investigation discussed in Gerritsen and Jansen (in press) was based on three particular points in time, since the data from the questionnaire of the Dutch Geographic Society (1879, 1895) were taken into consideration, too. However,

it was not possible to incorporate these data in this investigation because of the scarcity of frequent words and pronouns.

<sup>3</sup> In Gerritsen and Jansen (forthcoming), the pronoun *jij* will be dealt with in more detail.

<sup>4</sup> The following positions were left out of consideration;

- (i) the position before a vowel, where a homorganic glide element is inserted between the two vowels anyway;
- (ii) the position before [r], where no diphthong occurs in any North-Hollandic dialect at all.

<sup>5</sup> The preposition *bij* 'with' was excluded from this investigation because of the high number of reduction monophthongs. (cf. note 1).

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## BRABANTIC SANDHI AND THE ABSTRACTNESS DEBATE

DIDIER L. GOYVAERTS

From the late 1960's onwards an increasing number of phonologists have become extremely critical of the orthodox transformational-generative practice of using *abstract* underlying representations in the phonologies of various languages. The most extreme case was perhaps Vennemann's Natural Generative Grammar (cf. Hooper 1976). In my own Concrete Phonology (Goyvaerts 1975, 1977) I tried to put down a number of guidelines that would invariably yield relatively *concrete* phonologies. Also, many contributors to a forthcoming anthology on recent work in phonology (Goyvaerts 1979a) are highly critical of abstractness in phonological descriptions. What most of these 'concrete' phonologists have shown is that it is possible to present for any abstract solution to a problem an alternative solution in terms of a concrete framework. So far those linguists have failed to show that concrete solutions are *necessary* to account for certain data.

To put the burden of proof even more on the shoulders of those phonologists who favour concreteness in phonological descriptions I will present some data concerning a particular assimilation process in the Brabant dialect of Lier, which can only be accounted for by accepting the existence of an abstract underlying segment. What is more, it would seem to me that the data in question unequivocally shows what particular abstract form exists in the minds of the native speakers of the dialect in question. I would equally hold that an abstract solution is necessary; that is, an alternative concrete analysis does not seem to be available.

There are a number of assimilation and sandhi processes in Netherlandic which have been described by linguists belonging to both the structuralist and the generative tradition. A presentation of the rather complex phenomena involved can be found in any introductory textbook on Netherlandic phonology (Van den Berg 1962: 60ff., Blancquaert 1962: 154ff., Cohen et al. 1971: 50ff., Hermkens 1971: 53ff. etc.). The phenomena are complex because already at what might be called the level of mere observation it does not seem possible to perceive the assimilatory (sandhi) data

in a consistent fashion: several authors present what would seem to be contradictory material (see Van den Berg 1962: 63, 64, Blancquaert 1962: 156ff., Hermkens 1971: 53) whereas the actual assimilation or sandhi process itself can often be interpreted in different ways (e.g. certain voiceless consonants will become voiced but keep their tenseness, sometimes these voiceless consonants will become lax but remain voiceless and finally it may be the case that these voiceless tense consonants become voiced and lax). Although all this might lead one to conclude that it must be fairly difficult to agree upon a single, unified set of statements to describe the phenomena involved, it cannot be denied, however, that some general tendencies can easily be discerned.

Shifting one's attention from a corpus-based linguistics to an approach in which the linguistic knowledge of the individual becomes the prime object of interest has not led to agreement either. Witness the articles by Mey (1968, 1973), Hubers and Kooij (1973), Tops (1974) and Brink (1976).

In the present note I shall be concerned with one aspect of Netherlandic sandhi which is fairly straightforward in its operation and about which no controversy exists. I have in mind here the process of progressive assimilation whereby a word initial *v*, *γ* or *z* becomes voiceless when the preceding word ends in *p*, *t* or *k*. Examples:

<i>zənt</i> (sand)	but	<i>ətsənt</i> (the sand)	het zand
<i>zəxt</i> (smooth)		<i>nitsəxt</i> (not smooth)	niet zacht
<i>ve.l</i> (many)		<i>ikhəpfe.l</i> (I have many)	ik heb veel
<i>vək</i> (subject)		<i>datfək</i> (that subject)	dat vak
<i>vakánsi</i> (vacation)		<i>metfakánsi</i> (on vacation)	met vakantie
<i>γəvól</i> (case)		<i>duxəvól</i> (this case)	dit geval
<i>γe.f</i> (give)		<i>ikxe.f</i> (I give)	ik geef

The rule that would account for the data can be formulated thus:

$$(1) \left[ \begin{array}{c} C \\ + \text{ cnt} \end{array} \right] \rightarrow [- \text{ voice}] \quad / \quad \left[ \begin{array}{c} C \\ - \text{ cnt} \\ - \text{ voice} \end{array} \right] \quad \# \# \text{ —}$$

A most interesting case reveals itself in those dialects where sandhi occurs although there is no conditioning factor present on the surface. Consider the following data:

Dialect	Gloss	Standard Netherlandic Pronunciation
<i>vólak</i>	people	<i>volk</i>
<i>mɛfólak</i>	with people	<i>mɛtfolk</i>
<i>vœ.lvólak</i>	many people	<i>ve.lvolk</i>
<i>mɛfœ.lvólak</i>	with many people	<i>mɛtfe.lvolk</i>
<i>dafólak</i>	that people	<i>datfolk</i>
<i>γo.</i>	good	<i>γut</i>
<i>nixo.</i>	not good	<i>nitxut</i>
<i>əɲɔjvra.</i>	a good woman	<i>əɲúdəvrəu</i>
<i>nəɲɔjvɛnt</i>	a good man	<i>əɲúdəmən</i>
<i>mɛxɔjvrá.wə</i>	with good women	<i>metxúdəvrəuwə</i>
<i>zot</i>	fool, foolish	<i>zot</i>
<i>γo.sot</i>	very ('good') foolish	<i>γutsot</i>
<i>mɛsótə</i>	with fools	<i>mɛtsótən</i>
<i>nisot</i>	not foolish	<i>nitsot</i>

In the dialect forms, initial *v*, *γ* and *z* become voiceless not only under the normal conditions but also in a number of 'exceptional' instances where the preceding (conditioning) word does *not* end in a consonant. The list of words that end in a vowel, yet act as if a final consonant were present consists of forms such as [*mɛ*] 'with', [*ni*] 'not', [*dα*] 'that', [*γo.*] 'good' etc. Of interest is that in the speech of my informants, who speak the dialect of Lier (from which the data is taken), these forms *never* occur in a CVC shape; that is, never do these words appear with a final consonant. Yet the sandhi phenomena clearly indicate *that such a consonant must be underlyingly present* for otherwise the data cannot be accounted for. Notice that this situation holds not only for the dialect of Lier but also for a number of other dialects such as the dialect of Antwerp and several Flemish dialects.

Those linguists who object to abstract segments in phonological descriptions might wish to dismiss the present argument in favour of abstractness by invoking the spelling as the source for the presence of the underlying consonant. The spelling of the words [*mɛ*], [*ni*], [*dα*] and [*γo.*] is after all *met*, *niet*, *dat* and *goed*. However, this possible explanation cannot be appealed to, for the data which I have discussed here has been taken from the speech of (i) two children aged three and four who have not yet been in contact with the written language and (ii) an eighty-five year old man who can neither read nor write.

I must also report that taxonomic descriptions of the dialects in ques-



tion have completely ignored the sandhi phenomenon that we have considered here. That taxonomic linguists have failed to mention this phenomenon is remarkable for it is rather difficult not to notice the process, yet at the same time one must admit that given a taxonomic framework (or any concrete framework for the matter) it would be quite impossible to account for the above mentioned data in a principled way.

As regards a concrete view, some people may wish to argue that a proper treatment of the above mentioned sandhi phenomena should bear close resemblance to Kiparsky's account of the phenomenon of 'h aspirée' in French (Kiparsky 1973: 88ff.). Before discussing such a view, I will first recapitulate the most essential features of Kiparsky's approach.

The problematic issue involving the phenomenon of 'h aspirée' concerns the question of how to represent those French words which begin with vowels but which behave phonologically as if they began with consonants (the words in question are *written* with an initial *h*). That is, they fail to cause vowel elision in the preceding word (*la hache* vs. *l'âme*); they do not cause liaison (*les [le] hasards* vs. *les [lez] âmes*); they cause nasalization (*le bon [bõ] héros* vs. *le bon [bõn]ami*) and they get allomorphs such as *ma* rather than *mon* before them (*ma hache* vs. *mon âme*). Given these facts about this particular aspect of French phonology, it would seem that we have here a strong case in favour of setting up an (abstract) underlying initial consonant for h aspirée words.

However, Kiparsky – following Selkirk (1972) – manages to suggest an apparently non-abstract alternative. Instead of saying that h aspirée words have an abstract initial segment, Kiparsky prefers to say that they begin with a fixed double word boundary (# #). The reason being that the rules responsible for the above mentioned processes of elision etc. operate across at most one word boundary (#); a double word boundary (# #) always blocks them.

Before proceeding to a discussion of this particular proposal with respect to the Brabantic sandhi data, I should first like to make a few preliminary remarks. (i) I am fairly reluctant to look upon Kiparsky's solution as being a truly non-abstract alternative. The additional (morphological) boundary symbol functions as an auxiliary device in the phonology: its sole purpose is to regulate the application and non-application of certain phonological rules. In this respect its actual status does not seem to differ much from that of an abstract segment. In my opinion, Kiparsky shifts as it were from *abstract* phonology to *abstract* morphology (cf. Goyvaerts 1979b). (ii) De Cornulier (1979) has argued – quite convincingly to my mind – that the correct explanation for the problematic h aspirée words in French, in-

volves various intricate aspects of *syllabification* rather than mere assignment of boundary symbols to the words in question (or the postulation of an abstract element for that matter).

There is no need to further elaborate (i) and (ii) here. I refer the reader to the work of de Cornulier (1979) for an exhaustive treatment of a vast number of facts about *h aspirée* in French. However, it can also be shown that if we were to adopt Kiparsky's boundary solution for the Brabantic sandhi phenomena, this solution could also be dismissed on *purely internal grounds*.

1. Assuming that a number of lexical items in Brabantic carry an extra # boundary with them, the format of rule (1) would be:

$$(1') \left[ \begin{array}{c} C \\ \tau \text{ cnt} \end{array} \right] \rightarrow [-\text{voice}] \quad / \quad \left\{ \left[ \begin{array}{c} C \\ -\text{cnt} \\ -\text{voice} \\ \# \end{array} \right] \right\} \# \# \text{ —}$$

It would seem to me that there are a number of reasons in favour of the view that rule (1') should be rejected. To begin with, is it not rather implausible that a boundary should trigger off a process that is basically assimilatory in nature? Wouldn't one expect precisely the opposite viz. that a triple # boundary should *prevent* such an 'enchaînement' process (the function of the extra # boundary here is identical to that of an ad-hoc diacritic)?

2. For some speakers of the dialect of Lier (not the above mentioned informants though), the words [wα] and [dα] (*wat*, *dat*) are in free variation with [wαd] and [dαd] before a word that begins with a vowel:

$$\begin{array}{lll} d\alpha \acute{\imath}l\acute{\imath}k\acute{\imath} & \sim & d\alpha d\acute{\imath}l\acute{\imath}k\acute{\imath} \quad (\text{that little hole}) \\ w\alpha \varepsilon m\acute{\imath}k & \sim & w\alpha d\varepsilon m\acute{\imath}k \quad (\text{what have I}) \end{array}$$

All other words in the list remain without a final consonant in this very context ([γo.], [ni], [mε], [kwa.] etc. for *goed*, *niet*, *met*, *kwaad*).

Also, the declined form of adjectives like [kwa.] and [γo.] is sometimes realized as [kwɔ.jə] and [γöjə] whereas other adjectives ending in a vowel never show this [j] before suffixal schwa; e.g. the declined form of [lɔ.] 'lazy' (*lui*) is always [lɔ.ə]. That is:

$$\begin{array}{lll} kwa + \acute{\imath} & \rightarrow & kw\acute{\imath}(.)\acute{\imath} \quad (\sim kw\acute{\imath}.\acute{\imath}) \\ \gamma o. + \acute{\imath} & \rightarrow & \gamma\ddot{o}(.)\acute{\imath} \quad (\sim \gamma\ddot{o}.\acute{\imath}) \end{array}$$

but

$l\partial. + \partial \rightarrow l\partial(.)\partial$

The reader will immediately realize that in order to account for these phenomena in a principled way, one must assume that these words have an underlying final consonant. It is difficult to see how such an account could be provided by assuming underlying extra boundaries unless of course one would be willing to complicate the grammar enormously by having rules whereby a *boundary symbol* is rewritten as [d] and [j] respectively. This would, however, violate the naturalness condition of Postal (1968).

3. Finally, a solution in terms of rule (1') must be rejected because of the basic inconsistency it exemplifies: unlike in French where a particular configuration of boundary symbols has to *prevent* 'enchaînement' (which is in line with the assumption that double # boundaries are often to be interpreted as pauses on the surface level), the same configuration has to *create* 'enchaînement' in the Brabant dialect under consideration.

I conclude that Brabant sandhi constitutes a counterexample to the concrete view of phonology, i.e. the phenomenon can be accounted for only by accepting the existence of an abstract underlying segment.

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## MORPHEME BOUNDARIES AND SYLLABLE BOUNDARIES: A CASE FOR NATURAL PHONOLOGY\*

JAN G. KOOLIJ

1. In generative phonology, syntactic considerations have traditionally played a considerable role in the formulation of phonological rules at the level of the word. Somewhat paradoxically, this tradition has obscured rather than clarified the issue of the relationship between phonology and morphology. A case in point is the way boundary symbols have been used. I will argue in this paper that a number of phonological rules of Dutch refer to syllable boundaries and not to morphological boundaries. As an illustration of that claim, I will discuss at some length the role of the syllable boundary in one particular rule of Dutch word formation. The framework of the argument is Natural Generative Phonology, which imposes highly restrictive conditions on phonological rules and underlying forms and strongly advocates the separation of phonology and morphology. For a comprehensive introduction to NGF, I refer to Hooper 1976; a survey in Dutch is Van der Hulst 1978.

2.1. One phonological rule of Dutch which is generally conceived of as a rule that contains a morpheme boundary in its structural description is final devoicing. A familiar statement of the rule is:

(i)  $[-\text{Son}] \rightarrow [-\text{Vce}] / \text{ — } \#$

to be found, for example, in Booij 1975: 6 and 1977: 75, in Zwarts 1975: 11, and in Smith 1977:2. As a matter of fact, this view of final devoicing is equally well established in structuralist phonology, the difference being that 'word boundary' is used in the definition instead of 'morpheme

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boundary'. Let us call rule (i) the morphological definition of final devoicing. For German – where exactly the same phenomenon occurs – the morphological definition has been criticized on more than one occasion, for instance in Andersen 1972 and in Vennemann 1972. With these authors, I will assume that also for Dutch the rule should be formulated as a syllable-final devoicing rule:

- (i)  $[-\text{Son}] \longrightarrow [-\text{Vce}] / \text{---}\$$

In this form, the rule states that Obstruents in Dutch are devoiced when they occur immediately to the left of a syllable boundary.<sup>1</sup> Alternatively, it says that Obstruents must be voiceless in that position: I will assume here throughout that phonological rules often apply as redundancy rules only. In the rest of this paper, I will investigate some of the consequences of this reformulation of final devoicing.

Before I do that, some preliminary remarks about syllables and syllabification are in order. The notion syllable boundary is used here without prior definition of the notion syllable. Since it is notoriously difficult to give a satisfactory definition of the syllable in phonetic terms, I will (following Hooper 1972) content myself with an intuitive notion of the phonological syllable. For a language like Dutch, we may assume that any word contains as many syllables as it contains vowels, vowels being the only [+Syllabic] segments of the language. In the analysis of certain long vowels and of diphthongs this modest hypothesis is still not without its problems, but for the purposes of this paper it is adequate. With respect to the relationship between syllables and stress, I will use the binary terminology of Vanderslice and Ladefoged 1972. Syllables may be either [Heavy] or [Light]. [Light] syllables are unstressed and contain short or reduced vowels. [Heavy] syllables are stressed to some degree, but differ in that they can be either [+Accent] or [–Accent], where [+Accent] is equivalent to 'having primary stress'. Again, this brief summary leaves various aspects of syllabic structure undiscussed which are not directly relevant here.

Let us now consider the location of the syllable boundary, \$, in more detail. Syllabification is arrived at through the application of a small set of basic rules, some of which are presumably universal (Hooper 1972: 533 ff.). I will give examples of bisyllabic words to illustrate the rules; it is to be expected that, in words consisting of more than two syllables, the same rules apply with slight modifications. The following rules for the syllabification of Dutch words are relevant here.

- (iii)  $\phi \longrightarrow \$ / [+ \text{Syllabic}] \text{---} [- \text{Syllabic}] [+ \text{Syllabic}]$

In bisyllabic words with one intervocalic consonant or glide, the syllable boundary is located between the first vowel and the immediately following [– Syllabic] segment. This is true both when the first vowel is [+ Accent] as well as when the second vowel is [+ Accent]:

<i>káter</i>	‘tomcat’	<i>ká\$tar</i>	<i>katóen</i>	‘cotton’	<i>ka\$ tún</i>
<i>káno</i>	‘canoe’	<i>ká\$no</i>	<i>kanáal</i>	‘channel’	<i>ka\$ nál</i>

In words where the first vowel is [+ Accent] and short, the boundary may be located in rather than to the left of an intervocalic consonant (compare Vennemann 1972: 16, for German, and Eykman 1937: 144 ff., for Dutch):

<i>pás sen</i>	‘try on’	<i>pá\$ sən</i>	<i>Pá sen</i>	‘Easter’	<i>pá\$ sən</i>
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This difference may be viewed as a matter of phonetic detail. But as we shall see later on, there are contexts where the interaction of accentuation and syllabification has consequences also at the phonological level.

(iva)  $\phi \rightarrow \$ / [+ \text{Syllabic}] \text{ } [– \text{Syllabic}] \text{ } \text{ — } [– \text{Syllabic}] [+ \text{Syllabic}]$

(ivb)  $\phi \rightarrow \$ / [+ \text{Syllabic}] \text{ } \text{ — } [– \text{Syllabic}] [– \text{Syllabic}] [+ \text{Syllabic}]$

In bisyllabic words with two intervocalic consonants, there are two possibilities for the location of the syllable boundary. When the two adjacent [– Syllabic] segments cannot form a syllable-initial cluster because the phonotactic constraints of the language do not allow it, the syllable boundary will be located between two such segments, according to rule (iva). This is true for both the stress patterns considered here:

<i>kártel</i>	‘notch’	<i>kár\$ təl</i>	<i>kartél</i>	‘cartel’	<i>kár\$ tél</i>
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Otherwise, two adjacent [–Syll] segments will form a syllable-initial cluster, according to rule (ivb). It appears that the conditions for the application of these two rules are language-specific to quite an extent. Besides, the formation of syllable-initial clusters sometimes depends on the stress pattern and on the nature of the preceding and following vowel. Syllabification rules of this type were formulated in Hooper 1972, for Spanish, in Hoard 1971, for English, and in Vennemann 1972, for German. For Dutch, the conditions for the application of rules (iva) and (ivb) are roughly as follows: Two Obstruents will form a syllable-initial cluster both when the second vowel is [+ Accent] and when the first vowel is [+ Accent] and long. But when the first vowel is [+ Accent] and short, rule (iva) will apply rather than rule (ivb). Compare:

<i>méester</i>	‘master’	<i>mé\$ stər</i>	<i>meestál</i>	‘mostly’	<i>me\$ stál</i>
<i>kásten</i>	‘closets’	<i>kás\$ tən</i>	<i>kasteél</i>	‘castle’	<i>ká\$ stél</i>

An Obstruent will form a syllable-initial cluster with a Nasal or a Liquid both when the first vowel is [+ Accent] and when the second vowel is [+ Accent]. Compare:

*Cápri* 'Capri' *ká\$pri*      *katról* 'pulley' *ka\$tról*  
*cóbra* 'cobra' *kó\$bra*      *matrás* 'mattress' *ma\$trás*

Words where the [+ Accent] vowel in the first syllable is short may, again, behave differently:<sup>2</sup>

*cópla*      'copla'      *kóp\$la*

(ivc)  $\phi \rightarrow \partial / [+ \text{V}_{\text{Acc}}] [- \text{Syllabic}] \text{ --- } [+ \text{Cns}_{\text{Son}}] [- \text{V}_{\text{Acc}}] \text{ C}_0$

In the pronunciation of words such as *Capri*, *cobra*, a slight schwa will be heard between the Obstruent and the Sonorant. This is a typical feature of Dutch pronunciation, but what interests us here is that, in some contexts, insertion of a schwa has become a rule. In derivations with suffixes that begin with sonorant consonants followed by a weakly stressed or unstressed vowel, a schwa is obligatorily inserted between the stem and the suffix according to rule (ivc).<sup>3</sup> This means that a syllable is added to the word, after which the syllabification rule (iii) reapplies. Compare the following derivations with the suffixes *-lijk* [*lək*] and *-ling* [*lɪŋ*]:

*hátelijk* 'spiteful'      *há\$ta\$lək* from: *haat-lijk*  
*zéndeling* 'missionary'      *zén\$da\$liŋ* from: *zend-ling*

2.2. The most noticeable feature of the syllabification rules given so far is that there is no principled difference between their application in morphologically structured words and morphologically unstructured words. Compare:

(1a) <i>ijver</i>	'zeal'	<i>éu\$vær</i>
<i>rivier</i>	'river'	<i>ri\$vir</i>
<i>zólder</i>	'attic'	<i>zól\$dər</i>
<i>soldaat</i>	'soldier'	<i>sól\$dát</i>
(1b) <i>schrijver</i>	'writer'	<i>s<sup>x</sup>réu\$vær</i>
<i>gravin</i>	'countess'	<i>xra\$vin</i>
<i>hélde</i>	'heroes'	<i>hél\$dən</i>
<i>heldin</i>	'heroine'	<i>hél\$dín</i>
(2a) <i>chúster</i>	'cluster'	<i>klæs\$tar</i>
<i>Wébster</i>	'Webster'	<i>wép\$stər</i>

(2b) <i>schrijfsel</i>	‘piece of writing’	$s^x r \acute{e} \upsilon \S s \partial$
<i>schrijfster</i>	‘writer (female)’	$s^x r \acute{e} \upsilon \S s t \sigma r$

The words in the columns (1b) and (2b) are derivational and flectional forms with stems ending in voiced Obstruents: *schrijv-* [ $s^x r \acute{e} \upsilon$ ], *graav-* [ $x r a \upsilon$ ], and *held-* [ $h \acute{e} l d$ ]. When the syllabification rules (iii) and (iv) are applied, the result is that the syllable boundary is located immediately to the left of the stem-final Obstruent in the forms in (1b), and their syllabification is the same as in the words in (1a). Hence, final devoicing does not apply, because the structural description of rule (ii) is not met. In the derivations in (2b), the syllable boundary will be located immediately after the stem-final Obstruent, syllabification being the same in these words as in the words in (2a). Therefore, syllable-final devoicing applies.<sup>4</sup> If, however, we assume that final devoicing is a morpheme boundary rule rather than a syllable boundary rule, we will have to explain why the rule does not apply at the morpheme boundary in words such as *schrijver* whereas it does apply at the morpheme boundary in the words *schrijfsel* and *schrijfster*.

In the SPE tradition the explanation for the difference between the formations *schrijver* and *schrijfster* is sought in a distinction between morpheme boundaries. Some words contain a strong boundary, #, that word-internally has the same effect on the application of phonological rules as a word boundary, especially where the application of stress rules is concerned. Other words contain a weak boundary, +, that essentially has the same effect as no boundary at all. If final devoicing is defined as a rule which applies at the # boundary, the difference between the formations in (1b) and in (2b) is explained if it is assumed that all words in (1b) contain + boundaries and all words in (2b) contain # boundaries. Booij 1977: 73 states that the difference in syllabification, in particular, the application or non-application of the rule of final devoicing is the ‘decisive criterion’ in choosing between a # boundary and a + boundary, and in that respect modifies the position taken in Booij 1975: 6 where syllables were not mentioned. But the result is not markedly different: in his list of suffixes, all suffixes beginning with a [– Syllabic] segment are preceded by a # boundary that is introduced by the Word Formation Rules. Compare also p. 22: ‘if a suffix is preceded by a + boundary, it always has a vowel as its first segment’ (the reverse, as we shall see, is not true).

It is possible in principle that differences in morphological structure have effects on the phonology and on the structural description of phonological rules. But for the examples given so far, the introduction of distinct



boundary symbols unnecessarily complicates both the phonology and the morphology. Consider again the words *schrijver* and *schrijfster*. Both are derived from the stem *schrijv-*, 'write', *-er* being the unmarked agentive suffix and *-ster* the marked, [+ Female] agentive suffix. Apart from that difference, the suffixes have the same meaning, the same grammatical status and potentially the same degree of productivity. Phonologically, they are equivalent, too: both contain an unstressed vowel and will form a [Light] syllable. Under the syllable-final definition of final devoicing, the phonological difference between the two derivations receives a straightforward interpretation. In the derivation *schrijv-ster*, the [s] and the [t] in the suffix naturally form a syllable-initial cluster; the syllable boundary is located between that cluster and the stem-final Obstruent [v], after which rule (ii) applies. In the derivation *schrijv-er* the stem-final [v] becomes syllable-initial by rule (iii) and rule (ii) does not apply. In other words, whether or not final devoicing applies can be explained on the basis of phonological structure and syllabification alone, and whether or not the suffix is preceded by a # boundary is immaterial. The advantage of this analysis is twofold: the application of final devoicing is phonetically motivated, and the decision which boundary is present in a derivation can be made independently. Under the morphological definition of final devoicing, derivations with the suffixes *-er* and *-ster* would have to be assigned to different classes for no apparent reason at all.

The problems that present themselves here for the SPE analysis are connected with a certain ambiguity in the definition which is partly morphological and partly phonological. Though no too specific claims have been made in this connection, it has certainly been suggested (compare Chomsky and Halle 1963: 34 ff.) that the difference between strong boundaries and weak boundaries at the word level is roughly parallel to the difference between, on the one hand, suffixes that have a high degree of productivity and a transparent relationship to the total meaning of the word and, on the other hand, suffixes with a more lexical status that have varying degrees of productivity and a more or less opaque relationship to the meaning of the word. As a matter of fact, some # suffixes were thought to be introduced transformationally, at least in earlier versions of generative morphology. For some formations, transparency is indeed a useful criterion, but it is difficult to see how it would apply to the suffixes *-ster* and *-er*, which are equally productive and equally transparent. And there are other examples which show that the usefulness of this criterion is limited. A natural consequence of the morphological view of the distinction between the # boundary and the + boundary would be that all flec-

tional suffixes are # suffixes. But, as Booij correctly points out (1977: 93 ff.), Dutch flectional suffixes must be + suffixes when it is assumed that final devoicing applies at the # boundary, since final devoicing does not apply in the regular and productive formation of plurals of nouns with the suffix *-en*, as in *helden* 'heroes', plurals and infinitives of verbs with *-en*, as in *schrijven* 'write', and inflected forms of adjectives with *-e*, as in *goede* 'good'. For the syllable-final definition of final devoicing, these formations do not constitute a problem. The suffixes quoted are [Light] syllables that begin with a vowel, the fact that final devoicing does not apply is explained by prior application of the syllabification rule (iii), and there is no phonological evidence that flectional suffixes are preceded by a # boundary.<sup>5</sup>

Another distinction that has been associated with the difference between # boundaries and + boundaries, and perhaps the most important one, is the distinction between stress neutral suffixes and stress affecting suffixes. When the application of independently motivated stress rules is blocked in morphologically structured words, it is assumed that a strong # boundary is present in the derivation. The morphological definition of final devoicing requires that the difference between stress neutral and stress affecting suffixes is matched by the application and non-application, respectively, of final devoicing. It remains to be seen whether that is true. Consider the location of primary stress in the following derivations:

- |                          |                              |                 |
|--------------------------|------------------------------|-----------------|
| (3a) <i>gemeenschap-</i> | <i>gemeenscháppelijk</i>     | 'common'        |
| <i>xə\$mén\$sxəp</i>     | <i>xə\$men\$sxá\$pa\$lək</i> |                 |
| <i>afschuw-</i>          | <i>afschúwelijk</i>          | 'horrible'      |
| <i>əf\$sxüw</i>          | <i>əf\$sxü\$wə\$lək</i>      |                 |
| (3b) <i>opdring-</i>     | <i>opdringerig</i>           | 'obtrusive'     |
| <i>ɔp\$druŋ</i>          | <i>ɔp\$driŋə\$ɾəx</i>        |                 |
| <i>uitsloov-</i>         | <i>uitsloverig</i>           | 'trying hard to |
| <i>ʌüt\$slɔv</i>         | <i>ʌüt\$slɔ\$va\$ɾəx</i>     | please'         |

The adjectives in (3a) and (3b) are derived with suffixes that are phonologically equivalent: they begin with a vowel and each contain two [Light], unaccented syllables, [ələk] and [əɾəx], respectively. Whether or not the first schwa is inserted by rule (ivc) is not important here. The suffix *-(e)lijk* always affects stress and should, at least for that reason, be a + suffix. The suffix *-erig* affects stress in some derivations, as in the first example in (3b), but it is stress neutral in other derivations, as in the second example and in other adjectives, especially in new formations.

Actually, there may exist alternative accentuations for one and the same word formed with *-erig*; for instance, some people will say *uitslóverig* instead of *úitsloverig*. At any rate, the fact that the suffix *-erig* does not affect stress in a number of derivations must be explained. Along the traditional lines of generative phonology, the explanation would be that *-erig* is separated from the stem by a # boundary to the effect that its presence is disregarded in the application of the stress rules. Pronunciations like *opdringerig* can be accounted for by assuming that, in a number of adjectives, the # boundary has been weakened to a + boundary because the derivation has become semantically opaque. The existence of alternative pronunciations for the same word, such as *úitsloverig* and *uitslóverig* can be accounted for in the same way. But notice that final devoicing never applies in derivations with *-erig*, no matter whether it behaves as a # suffix or as a + suffix as far as stress assignment is concerned. This difficulty is a direct consequence of the morphological definition of final devoicing, and can be removed if we accept the syllable-final definition instead: rule (ii) cannot apply in derivations with *-erig* because of prior application of the syllabification rule (iii). The distinction between the # boundary and the + boundary can be maintained to explain the alternative stress patterns in derivations with *-erig*.

I should add, however, that not all differences in the application of stress rules can be explained in this fashion: the explanatory power of this device has its limits too. Leaving aside flectional suffixes, which never affect stress, there are also derivational processes that present problems in this respect. Schultink 1977: 195 observes that the productive suffix *-baar* [*bar*], ‘-able’, which forms adjectives that are most of the time quite transparent, regularly affects stress in derivations of the type:

- |      |                                   |   |              |
|------|-----------------------------------|---|--------------|
| (4a) | <i>tóelaat-</i><br><i>tú\$lat</i> | <i>toelaatbaar</i><br><i>tu\$lát\$bar</i> | ‘admissible’ |
|------|-----------------------------------|---|--------------|

but not in derivations of the type:

- |      |   |   |               |
|------|---|---|---------------|
| (4b) | <i>verwáarlooz-</i><br><i>vər\$wár\$loz</i> | <i>verwáarloosbaar</i><br><i>vər\$wár\$los\$bar</i> | ‘neglectable’ |
|------|---|---|---------------|

It is not plausible that this systematic difference in stress assignment is caused by a difference in morpheme boundaries or by boundary weakening. There does not seem to be an appreciable difference in transparency between these types of derivations. The difference rather is, as Schultink points out, that the adjectives in (4a) are derived from compound stems whereas the adjectives in (4b) are not. If this explanation is correct, it

would strengthen the general argument of his paper, namely that stress assignment in morphologically structured words in Dutch is, to a large extent, determined by morphological class and not just by morphological boundaries. Another argument in favor of that position is that the stress shift that can be observed in derivations like *gemeenschappelijk* 'common', and *opdringerig* 'obstrusive', quoted above, is typical for adjectives; the nominalizing suffixes *-er* 'er' and *-ing* 'ing' never affect stress.

All in all, it appears that the influence of morphological boundaries on the application of phonological rules is quite complex. And certainly, the distinction between strong boundaries and weak boundaries cannot be successfully motivated with the application of the rule of final devoicing.

3.1. I believe that this first approximation of the role of the syllable in Dutch phonology is essentially correct. But there remain a number of questions, some of which I will attend to below.

Firstly, the rules proposed so far require that stems are listed as basic elements rather than full words: *schrijv-* [ $s^x r \epsilon I v$ ]<sub>V</sub> 'write', *held-* [ $h \epsilon l d$ ]<sub>N</sub> 'hero', *liev-* [ $l i v$ ]<sub>A</sub> 'sweet, dear'. The final Obstruents of these stems are represented as [+ Vce] or rather as archi-segments in the sense of Hooper 1975. That representation is mildly abstract, and is at variance with the naturalness condition in its strongest form since the language clearly does not allow phonological units ending in Obstruents that are not voiceless. But stems are morphemes, and not yet phonological units. In a great number of fully productive derivational and inflectional processes, voiced segments actually turn up in words: *schrijven* [ $s^x r \epsilon I s v \partial n$ ], 'write (infinitive)', *helden* [ $h \epsilon l s d \partial n$ ], 'heroes', *lieve* [ $l i s v \partial$ ], 'sweet, dear (inflected form)'. These phonological forms can be accounted for in a natural way if the distinction between underlyingly voiceless and underlyingly voiced segments is present in the basic form. I would therefore choose this alternative and regard the word formation rules involved as actual phonological rules, rather than listing concrete, phonetically specified units as basic forms, as advocated in Vennemann 1974. Notice that both positions imply (compare the discussion in Hooper 1976: 182 ff.) that morphemes are not regarded as phonological units but as lexical and grammatical units that still have to be converted into phonological units.

A more central question in the context of this paper is the possible interaction of morphological boundaries and syllable boundaries at the word level. For the examples given so far, I have claimed that the application of final devoicing, that is, the presence or absence of a syllable boun-

dary immediately to the right of an Obstruent, is determined by phonological rules only. Rule (ii) applies in *schrijfster* but not in *schrijver*, it applies in the diminutive *heldje* [*hɛlʃtjə*] 'hero DIM' but not in the plural *helden*, it applies in the superlative *liefste* [*lifʃstə*] of the adjective *liev-* but not in the comparative *liever* [*liʃvər*], and its application is determined by the syllabification rules (iii) and (iv), not by morpheme boundaries. In particular, the fact that rule (ii) applies is not in itself a sufficient indication that the word contains a strong # boundary.

However, syllabification is not always phonologically determined. First of all, the application of rule (ii) certainly *is* obligatory at the word boundary. The singular forms of *schrijv-*, *held-* and *liev-* are undoubtedly *schrijf* [*s<sup>x</sup>rɛlf*], *held* [*hɛlt*], and *lief* [*lif*], respectively. Thus, for Dutch as well as for other languages we need an additional rule which (Hooper 1972: 537) we may give as:

$$(v) \quad \phi \rightarrow \$ / \left\{ \begin{array}{l} \# \# \text{ — } [+ \text{segment}] \\ [+ \text{segment}] \text{ — } \# \# \end{array} \right\}$$

This rule inserts a syllable boundary at the beginning and the end of every word, but I will be concerned here only with the end of the word. In the sentence

(5) *Daar ben ik geen held in*

'I'm not very good at that' (lit.: 'I am not a hero at that')

a syllable boundary is inserted between the words *held* and *in*, rule (ii) applies and the pronunciation is [*hɛltʃɪn*]. Notice that the basic syllabification rule (iii) may still apply after rule (ii) has applied in this case, yielding the quite normal realization [*hɛlʃtɪn*]. This means that the application of phonological rules, including their order of application, can be different in phrases and sentences as compared to their application word-internally. All that is comfortably traditional, and expressing such differences by using distinct boundary symbols is no more than the formalization of a long standing insight. Thus far, the structuralist formulation of final devoicing as a rule which applies at the word boundary is more correct than its generative reinterpretation as a morpheme boundary rule. But the status of rule (v) as a phonological rule may be questioned. Words are grammatical units, and though the word boundary # # behaves as a phonological and phonetic segment in many languages, a rule such as (v) introduces a morphological category into the phonology. As Hyman (1978) observes, word boundaries may originally have coincided with the pause boundary //, and rules that apply at the word boundary (of which final

devoicing is only one example) may therefore have had a phonetic motivation. But more often than not such rules are generalized to the extent that the phonetic motivation is very much in the background; for instance, rule (ii) will also apply when there is no phonetic pause in a phrase at all.

A more serious difficulty for my analysis so far is presented by derivations of the following type:

(6)	<i>goud-</i>	'gold'	<i>góudàchtig</i>	'gold-like'
	<i>xaud</i>		<i>xáut\$àx\$tax</i>	
	<i>huiz-</i>	'house'	<i>húisàchtig</i>	'house-like'
	<i>hΛüz</i>		<i>hÁüs\$àx\$tax</i>	

Here, the final Obstruent of the stem is devoiced in a context where the rules (ii)–(iv) would not predict it, namely before a vowel. Also, the stress pattern in these derivations is not in accordance with the standard generative stress rules (Evers and Huybregts 1975, Zwarts 1975, Booij 1977: 58 ff.): primary stress falls on the stem and not on the penultimate [Heavy] syllable. Comparable patterns of accentuation occur in derivations with the suffix *-loos* [*los*] when it has its transparent meaning 'without —, not having —' as well as in derivations with the suffix *-baar* [*bar*], 'able' of which we gave some examples in (4) above. Within an SPE framework, stress assignment in these words can be accounted for by assuming that the stem and the suffix are separated by a # boundary so that stress is not assigned by the Main Stress Rule but by some version of the Compound Stress Rule (compare Booij 1977: 72 ff.). And when final devoicing is defined as a rule which obligatorily applies at the # boundary, the voiceless Obstruent at the end of the stem in *goudachtig* and *huisachtig* is explained along the way. Though cyclic stress assignment, which is implied in this approach, is still a matter of debate, and though the adequacy of the stress rules proposed so far for Dutch is disputable also on other grounds, as noted in Schultink 1977, it remains true that the exceptional behavior of the derivations in (6) can be elegantly explained in this fashion. The same pattern, furthermore, and the same solution, presents itself in the formation of compounds:

(7)	<i>góud-àder</i>	<i>xáut\$à\$dər</i>	'vein of gold'
	<i>húisèigenaar</i>	<i>hÁüs\$è\$taxə\$nar</i>	'house owner'

As already observed in connection with rule (v) above, and earlier in the discussion of derivations with the suffix *-baar*, it is quite possible that the application of phonological rules is *also* determined by morphological structure, and that information on word class, type of word formation and

morphological boundaries is sometimes indispensable. It is not denied *a priori* in a natural approach that, for instance, morphological boundaries have a phonological effect and are therefore included in the structural description of phonological rules. The question rather is how and why that is done: it is advisable to separate rules that obligatorily refer to morphological categories from rules that do not. To give an example, the fact that the nominalizing suffix *-ing* never affects stress but the adjective-forming suffix *-ig* does is phonologically an arbitrary fact, and the corresponding rules or conditions are morphological rules or conditions. In the examples (6) and (7), we have a situation where morphological boundaries are potentially observed to the extent that a syllable boundary coincides with a morphological boundary.<sup>6</sup> For the examples in (7), this can be accounted for by extending the insertion of ## boundaries to compounds in general. The presence of the ## boundary explains that stress is assigned to the individual elements and readjusted by a later rule; the application of the final devoicing rule (ii) is explained by the introduction of a syllable boundary through application of rule (v). As in the case of certain phrases and sequences of words in the sentence, syllabification rules like rule (iii) — as well as assimilation rules — may still apply afterwards. One determining factor here seems to be the familiarity and the degree of lexicalization of a particular word. An extreme example is the word *aardappel*, ‘potato’, which is formally *aard-appel* [*ard-αpəl*], ‘soil-apple’ but is usually realized as [*ár\$ðà\$pəl*] or even [*ár\$ðə\$pəl*]. Of the less opaque word *tandarts* [*tánd-àrts*], ‘dentist, lit. tooth-doctor’ there exist at least three possible realizations: [*tánt\$àrts*], [*tán\$tàrts*] and [*tán\$dàrts*]. But, often, a syllable boundary is observed in compounds and final devoicing applies. Turning now to the derivations in (6), we could follow this line of reasoning and assume that these words too have an internal ## boundary. There are actually various arguments in favor of that analysis. Derivations with *-achtig*, *-loos*, and *-baar* are productive and mostly transparent, and the formations show strong resemblances to syntactic formations: for instance, something which is ‘—baar’ is something which ‘can be —ed’. Also, it is precisely this type of suffix that, quite exceptionally, can take part in conjunction reduction: *goud- of zilverachtig*, ‘gold-like or silver-like’, *deur- en raamloos*, ‘without doors and without windows’. Kiparsky 1975 notes that German has a class of suffixes that behave much like elements in compounds, and apparently some of their Dutch cognates do the same.

Still, I believe that this analysis has to be rejected, both for the compounds in (6) and for the derivations in (7). It is quite a step to posit word-internal ## boundaries, and there are lexical and phonological

objections against such a step. A compound, after all, is one word, and not two words, and there are assimilation rules which apply much more commonly across the word-internal boundary of compounds than across word-boundaries (Booij 1977: 91 ff.). Besides, the decision to insert ## boundaries in compounds and in derivations would be subject to the same general criticism that I levelled in this paper against the introduction of # boundaries in other contexts: it begs an interesting question, and it removes a difficulty in phonological and morphological analysis in a crude manner. Therefore, I will assume instead that compounds and certain derivations contain word-internal # boundaries. This still accounts for the undeniable similarity between the two types of word formation processes, given that we can safely assume a word-internal + boundary for most other derivations. It also explains that the stress pattern in these derivations is comparable to the regular stress pattern of compounds, though the details of the accentuation rules involved will still have to be worked out. And finally, the introduction of a strong internal boundary is in conformity with the intuition that the basic elements in Dutch compounds and in certain derivations, though not exactly words, lexically as well as phonetically are more word-like than stem-like,<sup>7</sup> and with the observation that the syllable boundary here coincides with the morpheme boundary.

But if we want to insert a syllable boundary in compounds and certain derivations, rule (v) can obviously not do the job. It will then have to be replaced by

$$(vi) \quad \phi \rightarrow \$ / \quad \left\{ \begin{array}{l} (\#) \# \text{ — } [+ \text{segment}] \\ [+ \text{segment}] \text{ — } \#(\#) \end{array} \right\}$$

The attractiveness of this proposal (which, in a slightly different form, is to be found in Booij 1977: 78) is that it is both simple and general. In word formation, we have two types of word-internal boundaries: + boundaries, which do not affect the application of phonetically motivated phonological rules, and # boundaries which do affect the application of these rules. Similarly, syllabification proceeds along the lines of the rules sketched in (iii)–(iv), but there are instances where insertion of syllable boundaries is arrived at through the application of morphological rules like (vi).

Regrettably, the situation is not as simple as that. A complete survey of the arguments pro and con is beyond the scope of this paper and also exceeds the limits of our present understanding of morphological structure and morpho-phonological rules. But a few points may be raised, summarizing observations made earlier in this paper, which show that rule (vi) is



not as attractive as it seems, and, in my opinion, quite untenable.

I tried to show in section 2.2. that the presence of a word-internal # boundary can explain why some derivations are not stressed according to the normal stress rules. The examples used were the adjectives *opdringerig* vs. *uitsloverig*, and the pronunciations *uitslóverig* vs. *úitsloverig* – and such contrasts are by no means unique or rare. The word *úitsloverig* retains the stress pattern that is assigned to the compound stem *úitsloov*, at least as far as the location of primary stress is concerned, but the words *uitslóverig* and *opdringerig* are stressed according to the normal stress rules: primary stress is located on the last syllable which is not inherently unstressed. This stress shift is typical for derivations with adjectival suffixes that do not themselves have primary stress (as a number of originally Romance suffixes in Dutch still do). Though, as observed by Schultink 1977, stress shift in other formations will have to be explained in terms of morphological type (as in his examples *verwáarloosbaar* vs. *toeláatbaar*), there remains a set of examples where a difference in stress in otherwise identical formations apparently correlates with boundary weakening, lexicalization, and sometimes also productivity. Next to *úitsloverig* and *opdringerig* we can mention the following examples:

(9) <i>úitstèkend</i>	‘protruding’	<i>ùitstèkend</i>	‘excellent’
<i>λüt\$stèkənt</i>		<i>λüt\$stè\$skənt</i>	
<i>ópvoèdend</i>	‘educating’	<i>òpvoèdend</i>	‘pedagogical’
<i>òp\$vu\$ðənt</i>		<i>òp\$vu\$ðənt</i>	
<i>kràmpàchtig</i>	‘cramp-like’	<i>kràmpàchtig</i>	‘spasmodic’
<i>kràmp\$àx\$təx</i>		<i>kràm\$pàx\$təx</i>	
<i>rèusàchtig</i>	‘giant-like’	<i>rèuzàchtig</i>	‘enormous’
<i>rø\$àx\$təx</i>		<i>rø\$zàx\$təx</i>	

The words in the first column are semantically transparent, the words in the second column are semantically opaque. The words in the second and the fourth row are derived from stems that have a final Obstruent which is underlyingly voiced. But the crucial difference between the derivations in the second row and those in the fourth row is that before an inherently [Light] syllable, final devoicing or any other rule which would point to the presence of a syllable boundary applies neither in the opaque formation, where the suffix is preceded by a + boundary, nor in the transparent formation, where the suffix is preceded by a # boundary. The same phenomenon was observed in the derivations *úitsloverig* vs. *uitslóverig*. In both morphological contexts, suffixes with inherently [Light] syllables and a vowel as the first segment undergo the syllabification rule (iii).

Notice, however, that before the [Heavy] syllable of the suffix *-achtig*, a syllable boundary *is* inserted at the strong boundary and final devoicing *does* apply in the first column, as it also does in the examples *goudachtig* and *huisachtig* given earlier. We can now make the following generalization about Dutch word formation: A syllable boundary is not present, or, alternatively, cannot be preserved before suffixes that begin with an unstressed or weakly stressed vowel, whatever the morphological boundary that precedes them. This generalization also applies to nominalizing suffixes such as *-ing* and *-er* and flectional suffixes such as *-en* and *-e*.

Rule (vi), then, is too strong. I have no generalizations to offer about prefixes, though it would appear that, in prefixation, syllable boundaries are often preserved. But the lower part of the rule will have to be modified: a syllable boundary is inserted to the left of a single strong # boundary only in compounds, and in derivations that are stressed like compounds. Since we are dealing with a morphological rule here, we might just as well list the suffixes that are involved: *-achtig*, *-loos*, *-baar* and a few others. Morphological rules precede phonological rules proper, so that, once the syllable boundary is inserted by rule (vi) in its revised form, all other syllabifications will be taken care of by the various subparts of rules (iii) and (iv). But I believe that some phonological generalization in the structural description of rule (vi) is still possible. Notice that the basic syllabification rule (iii), which we may abbreviate for convenience as  $V\text{\$}CV \rightarrow V\text{\$}CV$ , always applies in two contexts: (a) a context where the second vowel is [+ Accent], that is, has primary stress, as in *gravin* and (b) a context where the second vowel is weakly stressed or unstressed, as in *schrijven*. The context where a consonant – or two consonants, if they can form a cluster – do not become syllable-initial and the syllable boundary is located differently is the context where the suffix contains a vowel which has secondary stress,<sup>8</sup> and where the syllable with primary stress, or, the vowel which is [+ Accent] is located in the stem. Still tentatively, the relevant part of rule (vi) can be presented as

$$(va) \quad \phi \rightarrow \$ / \dots \left[ \begin{array}{c} V \\ \text{stress 1} \end{array} \right] \dots - \# C_o \left[ \begin{array}{c} V \\ \text{stress 2} \end{array} \right]$$

Not that this is a very satisfactory format: rules of this type should preferably be formulated in terms of syllables rather than in terms of segments. But the intention, I hope, is clear.

3.2. In this way, the following picture emerges. The phonological rules of Dutch include a set of syllabification rules that take into account two

types of data: the segmental structure of the word, in particular the number, the position, and the nature of the vowels, and accentuation. Accentuation, in its turn, is determined both by syllable structure and by morphological structure. The proposal made here thus rests on the assumption that syllabification rules and accentuation rules interact and do not necessarily apply in a fixed order. In addition, syllabification can be influenced by morphological boundaries. Only three types of boundaries are relevant at the level of the word (Hyman 1978): word boundaries, symbolized by ##, strong morpheme boundaries, symbolized by #, and weak morpheme boundaries, symbolized by +. Boundaries can be weakened: ## can become # and # can become +; we have assumed here that #  $\rightarrow$  + weakening is an indication of lexicalization. Only # boundaries can word-internally have effect on the application of phonological rules. As is the case with other rules, rules for syllabification that obligatorily refer to morpheme boundaries precede other syllabification rules, not because of extrinsic ordering but because they are a different type of rule and not strictly phonological. For the rule of final devoicing, which contains a syllable boundary in its structural description, this organization of the phonology has the following consequences: the rule always applies at the # # boundary, it applies at the word-internal # boundary under certain conditions only, and it never applies at the + boundary. The conditions for the application of final devoicing and comparable rules at the # boundary may be language-specific; already in such closely related languages as German and Dutch, the details may very well differ. On the other hand, if we assume, with Hyman 1978 that boundaries form a hierarchy where the ## boundary is the strongest and the + boundary is the weakest, it is plausible, and at least borne out by the facts of Dutch word formation, that the autonomy of syllabification rules, by which I mean their completely phonetic motivation, increases as the strength of boundaries decreases.

The introduction of syllables and rules for syllabification into the phonological component is, in my opinion, a substantial contribution to our understanding of the interaction of morphological structure, stress assignment, and the application of phonological rules. And one would hope that it also will prevent the use of morpheme boundaries without a morphological motivation, and the formulation of phonological rules that have no phonetic motivation. The phenomenon of final devoicing in Dutch is a clear instance of a rule that has caused both these things to happen.

## Notes

- 1 Within words as well as across word boundaries, Obstruents can be partially or completely devoiced through regressive assimilation.
- 2 Word-internal syllabification rules are not necessarily identical to syllabification rules at the word boundary. For instance, Dutch has a rule which states that words cannot end in short vowels, but in one possible realization of words like *katôen*, *kanaal*, the syllable-final vowel is short: [*kα\$ʔún*], [*kα\$nál*].
- 3 For a more detailed account of schwa insertion in Dutch, see Kooij 1977. It is likely that (ivc) is a morphological rule and not a phonological rule.
- 4 In Gilijamse unp., the same conclusion was reached independently.
- 5 The assumption that Dutch flecional suffixes are preceded by a + boundary has important consequences for the theory of word formation developed in Siegel 1974 and adopted for Dutch in Zwarts 1975. Siegel's theory predicts that suffixes with + boundaries never follow suffixes with # boundaries, but that, obviously, would not work for Dutch if flecional suffixes are + suffixes. See Booij 1977: 143 ff. for some discussion.
- 6 This also applies to various prefixes; in 'careful speech, the syllabification of verbs like *ôntéigenen* 'disown', *úitademen* 'breathe out' is [*ʔnt\$É\$ʔxɔ\$ʔnɔn*], [*Áút\$á-\$dɔ\$ʔmɔn*] rather than [*ʔn\$ʔtÉ\$ʔxɔ\$ʔnɔn*], [*Áú\$ʔtá\$ʔdɔ\$ʔmɔn*]. Compare Booij 1977: 96 ff.
- 7 Compare the observation in Vennemann 1974 that languages tend to favor the phonetic representation of words in isolation as basic forms.
- 8 Other Dutch suffixes that consist of [Heavy] syllables but do not receive primary stress are the nominalizing suffixes *-aar* [*ar*], as in *lêraar*, 'teacher', derived from the verbal stem *leer-* [*ler*], 'teach', and *-aard* [*ard*], as in *wréedaard*, 'cruel person', derived from the adjective *wreed-* [*vred*], 'cruel'. There are, however, compelling reasons to assume that these suffixes, unlike suffixes of the type *-achtig*, are preceded by a + boundary. But if these words contain a + boundary, the absence of primary stress on the final [Heavy] syllable cannot be explained. The solution, I believe, lies in a reformulation of the stress rules for morphologically structured words, rather than in the proposal made in Smith 1976 that *-aar* is underlyingly *-er* [*ər*]. For more discussion of stress rules see Kooij 1978.

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# THE STRESS PATTERNS OF DUTCH SIMPLEX WORDS: A FIRST APPROXIMATION

JAAP VAN MARLE

## 1. *The accentuation of Dutch simplex words: three views\**

### 1.1 *Introduction*

The students of Dutch who have examined the position of main stress (henceforth MS) in simplex words can, in conformity with the basic pattern they assume, be divided into three groups: those who claim that Dutch is a language with a (i) 'word-initial', (ii) 'word-final', or (iii) 'free accent' stress pattern.

In studies such as Gaarenstroom (1897: 76), Te Winkel (1901: 814), Zwaardemaker & Eijkman (1928: 266), Eijkman (1937: 148), Blancquaert (1969: 141), and Van Loey (1970: 109), Dutch is regarded as a language which (like the other Germanic languages) has a basically word-initial stress contour. i.e. these authors hold the view that, as a rule, MS is located on the *first* syllable of the word.

The opposite point of view can be observed in the studies written within the framework of transformational generative grammar. In conformity with Chomsky & Halle (1968) for English, it is claimed that for the grammar of Dutch a so-called 'main stress rule' can be motivated which – like the one proposed for English – (i) defines the position of MS with respect to the end of the word, and (ii) places MS on the *last* syllable save for certain disturbing conditions. This view can be found in among

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others Evers and Huybregts (1972), Van Lessen Kloeke (1972, 1973), Van den Berg (1974), and Booij (1977).

Finally, in his *Inleiding tot de Algemene Taalwetenschap* (= Introduction to General Linguistics) – the subtitle of which significantly reads ‘Introduction to the Grammar of Present-Day Dutch’, – A.W. de Groot considers Dutch to be a language with a ‘free accent’, an opinion which had already been formulated by Van Wijk (1939: 51). This means that the position of MS is not committed to a fixed position vis-à-vis the beginning or end of the word (De Groot 1968: 215, 217).

Before I discuss these views in greater detail – I will confine myself initially to the ‘stress-initial’ and the ‘stress-final’ approach –, some general remarks concerning accentuation are in order. As will be clear from the title of this paper, I will be concerned with the position of MS in *simplex* words only. It is this restriction that distinguishes the approach presented here from both the ‘stress-initial’ and the ‘stress-final’ approaches mentioned above. In particular, (i) the ‘stress-initial’ approach pays considerable attention to the exceptions to the basic pattern that can be observed within the class of complex words – i.e. simplex words are not considered a separate class –, whereas (ii) the generative treatment is characterized by a ‘main stress rule’ operating in simplex, and in a subset of complex words (i.e. those in which the so-called ‘+– affixes’ occur) as well. Like Schultink (1977a; 1977b; and 1978), I should like to defend the view that in Modern Dutch the stress-contours of simplex and complex words should be sharply distinguished, as in the latter the position of MS is highly dependent on the morphological make-up of the word at issue. As a result, in my opinion analyses that assume one pattern holding for both simplex and complex words (as in the ‘stress-initial’ approach), or propose one rule to handle both simplex and complex words (as in the ‘stress-final’ approach), are approaches of too ‘phonological’ a nature in that they leave the grammatical structure of complex words out of consideration, either entirely, or to a large extent.

## 1.2 *The ‘stress-initial’ approach*

Significantly, most linguists who claim that Dutch is a language with a ‘word-initial’ stress pattern advocate the traditional linguistic line of thought, i.e. an approach that is not always characterized by a rigorous separation of synchronic and diachronic arguments. The recurrent remarks on the ‘Germanic stress pattern’ in discussing the stress contours of Modern Dutch words illustrate this, albeit unintentionally. Typically, in

this approach *all* simplex words not conforming to the assumed pattern are regarded as 'nonnative'. So, without trying to make the contents of such a concept more accurate (and to integrate this notion into a theory about the structure of natural language), the distinction 'native-nonnative' is simply invoked to eliminate all occurring exceptions. For instance, in Blancquaert (1969: 170ff), words such as *a'zijn* 'vinegar', *je'never* 'genever', *Ma'ria* 'id.' *par'tij* 'party', *spi'nazie* 'spinach', etc. are explicitly regarded as loanwords because of their non-initial stress contour. I.e. this completely ad-hoc assignment of the feature 'nonnative' seriously handicaps an insightful account of the stress phenomena of Dutch simplex words.

Moreover, if one is concerned with descriptive adequacy, no doubt additional rules will be needed to account for the instances of non-initial stress. As far as I can see, only Blancquaert (1969) attempts to pursue this goal, and in fact his attempt aptly illustrates the necessity of additional rules. The reader is encouraged to refer to the important remarks on pp. 170-174 of Blancquaert's study.

### 1.3 The 'stress-final' approach

The source of inspiration for the 'stress-final' approach for Dutch no doubt lies in Chomsky & Halle's analysis of English. There, a 'main stress rule' is proposed for a language of Germanic origin, which defines the position of MS with respect to the end of the word, and principally locates MS on the *final* syllable! The linguists in defense of this type of analysis for Dutch have pointed out the enormous number of words that are stressed non-initially and cannot be regarded as loanwords in a synchronic analysis. Although these studies make no ad-hoc use of the 'native-nonnative' distinction, this is not to say that this approach does not run into serious trouble. I will illustrate these problems on the basis of Booij's analysis of the stress contours of simplex words in Modern Dutch, as it is this study which provides the most detailed 'stress-final' description of this language. One should bear in mind, however, that the criticisms raised here must not be looked upon as fortuitous shortcomings of Booij's study; rather they concern problems which to my mind are directly related to the 'stress-final' approach as such (cf. Van Marle, 1978b).

In Booij (1977:61) the following rule is proposed as the main stress rule for Dutch:

$$(1) \quad V \rightarrow [1 \text{ stress}] / [X \text{ --- } C_O ((\textcircled{O} C_O) \{ \textcircled{O} C_O \})]_{N,A,V}$$



Clearly this rule is a variant of Chomsky & Halle's Main Stress Rule, which in a simplified form reads (quoted from Booij 1977: 58):

$$(2) \quad V \rightarrow [1 \text{ stress}] / [X \text{ — } C_O ((\check{V}C_O^l) \check{V}C_O^l)]_{N,A,V}$$

where  $\check{V}$  indicates a lax vowel.

Booij is aware of the fact that the claim inherent in rule (1) is that Dutch is a language in which word-final stress prevails. In discussing this consequence of his main stress rule in the light of the traditional conception of the word-initial stress pattern of Dutch words, he points out — as Halle & Keyser (1971) did for English — that it is no longer correct to assume that Dutch is a stress-initial language, since its character has changed radically as the result of the intrusion of many loanwords which 'are experienced as native words nowadays' (Booij 1977:61). In this connection Booij emphasizes the crucial character of the category of bisyllabic words ending in a consonant or a diphthong that are stressed word-finally, and of the trisyllabic words that are stressed on their penultimate. Cf. (3a) and (3b), respectively:

- |     |     |                   |            |                 |           |
|-----|-----|-------------------|------------|-----------------|-----------|
| (3) | (a) | <i>ba'naan</i>    | 'banana'   | <i>gor'dijn</i> | 'curtain' |
|     |     | <i>ba'salt</i>    | 'id.'      | <i>ka'non</i>   | 'gun'     |
|     |     | <i>fat'soen</i>   | 'decency'  | <i>kar'wei</i>  | 'job'     |
|     |     | <i>fo'rel</i>     | 'trout'    | <i>ma'nier</i>  | 'manner'  |
|     |     | <i>ge'lei</i>     | 'aspic'    | <i>to'maat</i>  | 'tomato'  |
|     |     |                   |            | etc.            |           |
|     | (b) | <i>ju'jube</i>    | 'id'       |                 |           |
|     |     | <i>kom'kommer</i> | 'cucumber' |                 |           |
|     |     | <i>o'ranje</i>    | 'orange'   |                 |           |
|     |     | <i>ra'barber</i>  | 'rhubarb'  |                 |           |
|     |     | etc.              |            |                 |           |

Besides rule (1), the following rule forms part of the grammar of Dutch (Booij 1977:63):

$$(4) \quad V \rightarrow [1 \text{ stress}] / [X [\text{+French}] C_O (\partial C_O)]_{N,A,V}$$

The main task of this rule is to account for the correct stress pattern of words ending in a stressed vowel, cf. *bu'reau* 'desk', *che'mie* 'chemistry', *i'dee* 'idea', *re'çu* 'receipt', etc. And by means of the same feature the correct stress contour of words such as *auto-da-fe* 'id.' *be'ha* 'bra', *cho-co'la* 'chocolate' (mentioned by Booij, p. 59), *Pe'ru* 'id.', *pyg'mee* 'pygmy',

*tro'chee* 'id.' can be determined, although none of these words have a French origin. This means that the status of a feature like [French] is that of a synchronic tag only.

Note, however, that rule (4) – disregarding for the moment the feature [French] – predicts the position of MS in all the words mentioned in (3) without any adjustment. In other words, these forms do not present evidence for the correctness of the main stress rule (cf. rule (1)) in a grammar of Present-Day Dutch, given that (i) rule (4), according to Booij, is needed on independent grounds, and (ii) the feature [French] serves as a synchronic tag only.

Booij's analysis of the stress patterns of Dutch simplex words is characterized by the use of two all but identical rules: both rule (1) and rule (4) define the position of MS with respect to the end of the word, and by and large both rules locate MS on the final syllable. It appears that all the data which in Booij's opinion crucially support his main stress rule (which, of course, is the formal representation of the 'stress-final' pattern assumed for Dutch) can easily be accounted for by rule (4). It is this fact which casts doubt on the validity of this main stress rule for the grammar of Modern Dutch.

## 2. Substantive evidence: stress shifts in Dutch

### 2.1 Stress shift type (1)

Although I criticized the 'stress-final' approach on internal grounds in the previous section, it is no doubt firmly supported by the existence of so-called 'substantive evidence', a factor to which Booij – correctly, I assume – attaches great value. For in a number of cases MS shifts to another position within the word, and interestingly, this 'new' position of MS conforms to the patterns specified by Booij's main stress rule, whereas the 'original' position does not.

In Booij (1977: 60-67) the following data are presented:

- |     |                    |             |                            |         |
|-----|--------------------|-------------|----------------------------|---------|
| (5) | <i>demo'kratie</i> | 'democracy' | (for: <i>demokra'tie</i> ) | (p. 60) |
|     | <i>hege'monie</i>  | 'hegemony'  | (for: <i>hegemo'nie</i> )  | (p. 60) |
|     | <i>kata'logus</i>  | 'catalogue' | (for: <i>ka'talogus</i> )  | (p. 67) |
|     | <i>norma'liter</i> | 'normally'  | (for: <i>nor'maliter</i> ) | (p. 67) |
|     | <i>no'tulen</i>    | 'minutes'   | (for: 'notulen)            | (p. 67) |
|     | <i>pa'gina</i>     | 'page'      | (for: 'pagina)             | (p. 67) |

Comparable data can be found in Van Lessen Kloeke (1973:227), for example:<sup>1</sup>

- (6) (a) *bad'minton* 'id.' (for: 'badminton)  
*depo'sito* 'deposit' (for: *de'posito*)  
*e'xodus* 'id.' (for: 'exodus)  
*high fide'lity* 'id.' (for: *high fi'delity*)  
*inter'view* 'id.' (for: 'interview)  
*man'chester* 'id.' (for: 'manchester)  
*petro'leum* 'id.' (for: *pe'troleum*)
- (b) *Ar'kansas* (for: 'Arkansas)  
*Can'berra* (for: 'Canberra)  
*Ed'monton* (for: 'Edmonton)  
*Hel'sinki* (for: 'Helsinki)  
*Karls'ruhe* (for: 'Karlsruhe)  
*Nia'gara* (for: *Ni'agara*)  
*Stock'holm* (for: 'Stockholm)  
*Tam'pere* (for: 'Tampere)

Finally, Van Lessen Kloeke (1973:227-228) mentions the 'wrong' stress patterns of English and German words when they are pronounced by native speakers of Dutch:<sup>2</sup>

- (7) (a) *co'mment* (for: 'comment)  
*gene'rative* (for: 'generative)  
*inte'resting* (for: 'interesting)  
*nece'ssary* (for: 'necessary)  
*ordi'nary* (for: 'ordinary)  
*pu'llover* (for: 'pullover)
- (b) *A'raber* (for: 'Araber)  
*Gramma'tik* (for: *Gra'mmatik*)  
*Mo'nate* (for: 'Monate)

Although I fully agree with Booij (1977) and Van Lessen Kloeke (1973) when they attach great value to the 'substantive evidence' constituted by stress shifts and mispronunciations, in my opinion it is to be regretted that both authors do not take into account the rather restricted nature of the shifts they discuss. Both authors appear to draw a conclusion from these shifts that has direct consequences for the overall stress pattern of Dutch, whereas from a structural point of view they have a rather limited scope. Note, for example, that in the data from (5) to (7) only a

few instances can be found where the shift of MS to the right takes place in bisyllabic words. Besides, hardly any examples can be found in which MS shifts to the final syllable of a trisyllabic word ending in a lax vowel followed by a consonant. Note, however, that Booij's main stress rule predicts these shifts as well.

Although I consider the conclusions drawn from the data in (5) – (7) too far-reaching, I fully agree with both authors that shifts of MS to the right, and in some cases from the final to the penultimate syllable – note that I do not wish to claim a priori that all shifts can be brought together under one denominator – occur far too frequently to regard them as merely accidental phenomena. Additional data are not hard to come by, compare:

- (8) (a) *bisyllabic words*
- |                |         |                |
|----------------|---------|----------------|
| <i>sa'tee</i>  | 'sateh' | (for: 'satee)  |
| <i>to'ffee</i> | 'id.'   | (for: 'toffee) |
- (b) *polysyllabic words; MS shifts to the penultimate syllable*
- |                     |              |                             |
|---------------------|--------------|-----------------------------|
| <i>a'dios</i>       | 'id.'        | (for: <i>adi'os</i> )       |
| <i>a'libi</i>       | 'id.'        | (for: 'alibi)               |
| <i>am'fibie</i>     | 'amphibian'  | (for: <i>amfi'bie</i> )     |
| <i>A'ttila</i>      | 'id.'        | (for: 'Attila)              |
| <i>au'topsie</i>    | 'autopsy'    | (for: <i>autop'sie</i> )    |
| <i>Bo'gota</i>      | 'id.'        | (for: <i>Bogo'ta</i> )      |
| <i>bun'galow</i>    | 'id.'        | (for: 'bungalow)            |
| <i>ca'mera</i>      | 'id.'        | (for: 'camera)              |
| <i>ex ca'thedra</i> | 'id.'        | (for: <i>ex 'cathedra</i> ) |
| <i>He'racles</i>    | 'id.'        | (for: 'Heracles)            |
| <i>Hero'dotus</i>   | 'id.'        | (for: <i>He'rodotus</i> )   |
| <i>Ke'kkonen</i>    | 'id.'        | (for: 'Kekkonen)            |
| <i>lino'leum</i>    | 'id.'        | (for: <i>li'noleum</i> )    |
| <i>mas'cara</i>     | 'id.'        | (for: 'mascara)             |
| <i>me'rites</i>     | 'id.'        | (for: 'merites)             |
| <i>metro'polis</i>  | 'id.'        | (for: <i>me'tropolis</i> )  |
| <i>O'dense</i>      | 'id.'        | (for: 'Odense)              |
| <i>per'gola</i>     | 'id.'        | (for: 'pergola)             |
| <i>poli'ticus</i>   | 'politician' | (for: <i>po'liticus</i> )   |
| <i>Sera'jewo</i>    | 'id.'        | (for: <i>Se'rajewo</i> )    |
| <i>sy'llabus</i>    | 'id.'        | (for: 'syllabus)            |

Finally, a rich source of data is constituted by Turkish words as

pronounced by native speakers of Dutch who are unfamiliar with this language.<sup>3</sup> Words of three syllables or more are usually stressed on the penultimate. Compare the following examples in which *i* represents a high vowel that is [+ back] and [– round]:<sup>4</sup>

- (9) *An'kara* (for: 'Ankara)  
*Ban'dirma* (for: 'Bandirma)  
*ban'kasi* (for: 'bankasi)  
*ca'ddesi* (for: 'caddesi)  
*Diar'bakir* (for: Di'arbakir)  
*Eski'sehir* (for: Es'kisehir)  
*Ka'ppisi* (for: Kappi'si)  
*Kara'deniz* (for: Ka'ra deniz)  
*lokan'tasi* (for: lo'kantası)  
*Orta'hisar* (for: Or'tahisar)  
*top'kapi* (for: 'topkapi)

The conclusions which follow from the data in this section are twofold: (i) in the overwhelming majority of the cases a rightward shift of MS can be observed, and (ii) in some cases MS switches from the final syllable to the penultimate. A more detailed analysis of these stress shifts will be presented in section 5.

## 2.2 Stress shift type (2)

In section 1.3 an internal inconsistency of the 'stress-final' approach of Booij (1977) was discussed, i.e. the fact that in his account of the stress phenomena in Dutch simplex words, two almost completely overlapping rules are proposed. This is not all, however. In Dutch, many simplex words occur that are not stressed in conformity with the patterns indicated by Booij's main stress rule. Compare the words in (10), which are all stressed *word-initially*, and can only be accounted for by means of one or more 'minor rules' within the framework of a strict 'stress-final' approach (cf. Booij 1977: 67-70).

- (10) (a) *'ahob* 'level crossing' *'kalong* 'bat'  
*'ambacht* 'trade' *'kievit* 'peewit'  
*'arbeid* 'work' *'kokos* 'coconut'  
*'Arnhem* 'id.' *'koning* 'king'  
*'asbest* 'asbestos' *'lichaam* 'body'  
*'badding* 'batten' *'nylon* 'id.'

	'Bibeb	'id.'	'oorlam	'rum ration'
	'bizon	'buffalo'	'oorlog	'war'
	'centrum	'centre'	'paling	'eel'
	'chaos	'id.'	'sambal	'id.'
	'condor	'id.'	'Sittard	'id.'
	'eland	'moose'	'vijand	'enemy'
	'hertog	'duke'	'wisent	'id.'
	'kalief	'calif'	'Wijnand	'id.'
			etc.	
(b)	'albatros	'albatross'	'Nijmegen	'id.'
	'Antwerpen	'Antwerp'	'olifant	'elephant'
	'armoede	'poverty'	'ooievaar	'stork'
	'Boudewijn	'id.'	'sanhedrin	'sanhedrim'
	'bruidegom	'bridegroom'	'selderij	'celery'
	'bungalow	'id.'	'stadion	'stadium'
	'carnaval	'carnival'	'weduwe	'widow'
	'Eskimo	'id.'	'wielewaal	'golden oriole'
	'Feyenoord	'id.'	'Zanzibar	'id.'
	'indigo	'id.'	'zwezerik	'thymus'
	'kakkerlak	'cockroach'	etc.	
(c)	'Amerongen	'id.'		
	'havezate	'manorial farm'		
	'Hindeloopen	'id.'		
	'Hoewelaken	'id.'		
	'knickerbocker	'id.'		
	'Scheveningen	'id.'		
	etc. <sup>5</sup>			

To be sure, it is not very insightful to cite exceptions to the proposed rules. However, these forms become important when they are looked upon as an indication of the existence of a pattern not in conformity with the structure implied by Booij's rules. In my opinion arguments can be presented to indicate that the exceptional forms mentioned above actually form part of such a pattern.

First of all it should be emphasized that none of the words in (10c) and note 5 can be accounted for simply within the framework of Booij's strict 'stress-final' approach. Especially words such as *'infinities'* 'infinite', *'nominatief'* 'nominative', etc., and *'maliënkolder'* 'hauberk' (cf. note (5)) seem to present serious difficulties for this analysis.

Another argument in favour of the 'stress-initial' approach is the follow-

ing. Besides the stress shift discussed in 2.1, another shift occurs which invariably results in the placement of MS on the *first* syllable of the word. Undoubtedly this shift constitutes 'substantive evidence' for a 'word-initial' stress pattern in exactly the same way as the shift in 2.1 did for the 'stress-final' approach. Notably it is this shift to the first syllable on which my doubts are based concerning the far-reaching consequences attached both by Van Lessen Kloeke and Booij to the shift discussed in 2.1, since in my view the 'stress-final' approach is totally incapable of integrating the 'substantive evidence' for a 'stress-initial' pattern. Note, by the way, that neither Van Lessen Kloeke nor Booij present any example in which this shift to the first syllable of the word can be observed.

Throughout the history of Dutch, stress shifts can be observed which all have in common that MS is shifted to the first syllable of the word. In Gaarenstroom (1897) the following data can be found:

- (11) (i) Many words borrowed from Latin at a very early stage were completely adapted to the native pattern. Among these words the stress shift to the first syllable of the word is extremely common. Cf.: 'vlegel 'trash' (*fla'gellum*), 'zegel 'seal' (*si'gillum*), 'zeker 'sure' (*se'curus*), 'zolder 'attic' (*so'larium*), etc. (Gaarenstroom 1897: 76).
- (ii) Words borrowed from Latin in which the shift took place without a further adaptation to the Dutch structure, e.g. 'altaar 'shrine' (*al'tare*), 'interest 'id.' (*inter'est*), 'interval 'id.' (*inter'val*), etc. (Gaarenstroom 1897: 17-77). The same phenomenon can be observed within the group of grammatical terms. Compare the words ending in the sequence *ief* which were originally stressed word-finally: 'accusatief 'accusative', 'adjectief 'adjective', 'indicatief 'indicative', 'substantief 'substantive', etc. The same shift can be found in 'object 'id.' and 'subject 'id.', which were originally stressed on the final syllable (Gaarenstroom 1897: 77).
- (iii) Comparable to the examples in (ii) are the words of Greek origin that have adopted a word-initial stress-pattern. Cf. 'archipel 'archipelago' and 'horizon 'id.' from *archi'pelagos* and *ho'rizon*, respectively (Gaarenstroom 1897: 77).
- (iv) In French loanwords the same shift can be found, cf. the following groups that are comparable with the forms in (ii) and (iii) above:
- 'baljuw 'bailiff' (*bai'lli*), 'harnas 'coat of arms' (*har'nais*) 'hobo 'oboe' (*haut'bois*), 'paspoort 'passport' (*passe'port*) 'quintessens

'quintessence' (*quinte'ssense*), '*ramenas* 'black radish' (*ramo'nasse*), '*ratjetoe* 'hash' (*rata'touille*) '*sassefras* 'sassafras' (*sassa'fras*), '*tricot* 'knitwear' (*tri'cot*), '*uniform* 'id.' (*uni'form*) (Gaarenstroom 1897: 77).

— French words ending in *-ard* received word-initial stress as well: '*bastaard* 'bastard', '*ponjaard* 'dagger', etc. (Gaarenstroom 1897: 77).

It is clear that the stress shift mentioned above is diametrically opposed to the structure indicated by the 'stress-final' pattern, since on the whole the stress contours which originally characterized the words in (11) were in conformity with the 'stress-final' pattern that Booij and Van Lessen Kloeke claim to hold for Dutch, whereas the stress patterns which arose after this shift had taken place are not! In this way we are forced to regard this systematic change as a drift from the regular patterns.

Note that this stress shift to the first syllable of the word is still a living aspect of the structure of modern Dutch, i.e. this shift cannot be looked upon as a phenomenon the effect of which is limited to the earlier stages of the language.

Unfortunately I do not know of any detailed study concerning this topic (the standard handbooks and dictionaries are quite insufficient in this respect), but I have collected the following data:<sup>6</sup>

- |          |   |                  |                 |                    |
|----------|---|------------------|-----------------|--------------------|
| (12) (a) | <i>'dragon</i>                          | <i>'tarragon</i> | <i>'ozon</i>    | <i>'ozone</i>      |
|          | <i>'moeflon</i>                         | <i>'moufflon</i> | <i>'ponton</i>  | <i>'pontoon</i>    |
|          | <i>'orlon</i>                           | <i>'id.'</i>     | <i>'tampon</i>  | <i>'id.'</i>       |
| (b)      | <i>'affix, 'infix, 'prefix, 'suffix</i> |                  |                 |                    |
| (c)      | <i>'absinth</i>                         | <i>'id.'</i>     | <i>'islam</i>   | <i>'id.'</i>       |
|          | <i>'ahorn</i>                           | <i>'acorn</i>    | <i>'kiosk</i>   | <i>'book-stall</i> |
|          | <i>'Amman</i>                           | <i>'id.'</i>     | <i>'koran</i>   | <i>'id.'</i>       |
|          | <i>'ampul</i>                           | <i>'ampulla</i>  | <i>'kornak</i>  | <i>'mahout</i>     |
|          | <i>'arak</i>                            | <i>'id.'</i>     | <i>'Marcel</i>  | <i>'id.'</i>       |
|          | <i>'aspik</i>                           | <i>'aspic</i>    | <i>'mistral</i> | <i>'id.'</i>       |
|          | <i>'atol</i>                            | <i>'id.'</i>     | <i>'norit</i>   | <i>'id.'</i>       |
|          | <i>'bankroet</i>                        | <i>'bankrupt</i> | <i>'parfum</i>  | <i>'perfume</i>    |
|          | <i>'Bornholm</i>                        | <i>'id.'</i>     | <i>'Soedan</i>  | <i>'id.'</i>       |
|          | <i>'eunuch</i>                          | <i>'id.'</i>     | <i>'toean</i>   | <i>'tuan</i>       |
|          |   |                  | etc.            |                    |
| (d)      | <i>'abri</i>                            | <i>'shelter</i>  | <i>'manie</i>   | <i>'mania</i>      |
|          | <i>'ansjo (vis)</i>                     | <i>'anchovy</i>  | <i>'orgie</i>   | <i>'orgy</i>       |



	'bistro	'id.'	'papa	'daddy'
	'bougie	'spark-plug'	'Peru	'id.'
	'dada	'id.'	'quintro	'id.'
	'mama	'mummy'		
(e)	'arbiter	'id.'		
	'bodega	'id.'		
	'flamingo	'id.'		
	'Granada	'id.'		
	'papoea	'papua'		
(f)	'asterisk	'asterisc'	'pantalon	'trousers'
	'camembert	'id.'	'paradox	'id.'
	'charlatan	'id.'	'paragraaf	'paragraph'
	'colofon	'id.'	'paranimf	'usher'
	'feuilleton	'serial'	'Ramadan	'id.'
	'karamel	'caramel'	'Rataplan	'id.'
	'marsepein	'marchpane'	etc. <sup>7</sup>	

In this case, as in (11), the original stress pattern of nearly all of the words mentioned in (12) was in conformity with the basic patterns specified by the 'word-final' approach as worked out in Booij (1977). That is, all bisyllabic and trisyllabic words ending in a consonant (i.e. 12a, b, c, f) were originally stressed word-finally, whereas the trisyllabic words ending in a vowel or in a shwa followed by a consonant (cf. 12e) bore MS on the penultimate.<sup>8</sup>

This stress shift to the first syllable of the word can also be observed in the class of words whose stress pattern is not in conformity with the main stress rule proposed in Booij (1977). Compare:

- (13) (a) 'jambouree 'id.'  
           'kaketoë 'cockatoo'  
           'kariboe 'cariboo'  
           'kolibrie 'humming-bird'
- (b) 'Caracas, 'Istanbul, 'Wisconsin, 'Wyoming

Originally the words in (13a) were stressed on their final syllable, i.e. within the framework of Booij (1977) they have to be accounted for by the 'French' stress rule (cf. rule (4) in section 1.3 of this paper), since the main stress rule predicts penultimate stress here. As for the forms in (13b), the situation is precisely the reverse: the main stress rule predicts word-final stress in these cases, whereas the original position of MS is on the penultimate. In Booij (1977) stress patterns like these are accounted for by a special 'minor' rule (ibid.: 69-70).

Just as with the forms in (11) and (12), in my opinion the 'stress-final' approach is incapable of integrating the shift that has taken place in the words mentioned in (13).

### *3. Dutch as a 'free-stress' language*

#### *3.1 The 'two-pattern' approach*

In a summary of the preceding two sections the following picture arises:

- (i) The 'stress-initial' approach is obliged to take recourse to a completely ad-hoc use of the feature [ $\pm$  native] (cf. 1.2). Moreover, to be descriptively adequate, rules will have to be formulated that refer to the alleged nonnative materials (cf. 1.2).
- (ii) In contrast with the 'stress-initial' approach, the analyses resulting from the 'stress-final' approach are always meant to be exhaustive. In other words, these analyses aim at descriptive adequacy. The only description that – as far as I am aware – satisfies these standards at least in spirit, i.e. Booij (1977), however, suffers from internal inconsistency, since at least two rules figuring in this analysis overlap nearly completely (cf. 1.3). Moreover, besides the two overlapping rules (one of which is the main stress rule), other rules are needed to account for the non-final stress patterns (cf. 2.2).
- (iii) The 'stress-initial' approach does not offer a framework to account for the stress shifts of type (1) (cf. 2.1).
- (iv) The 'stress-final' approach cannot explain the stress shifts of type (2) (cf. 2.2).
- (v) Stress shifts of type (1) can be characterized as follows:
  - (i) On the whole MS undergoes a rightward shift, i.e. a shift towards the end of the word, and
  - (ii) in some cases MS switches from the final to the penultimate syllable. In this way this shift can be interpreted as 'substantive evidence' for the 'stress-final' approach, i.e. an approach which defines the position of MS with respect to the end of the word, and principally locates MS on the final syllable (cf. 2.1).
- (vi) On the other hand, being a shift to the first syllable of the word, stress shifts of type (2) can be considered to support the 'stress-initial' approach (cf. 2.2).

In my opinion the 'stress-initial' and the 'stress-final' approaches are weak in that they both take for granted that there is only *one* basic pattern for Dutch simplex words. If one takes the substantive evidence that is constituted by the two stress shifts seriously, it is no longer possible to stick to an approach in which only one pattern is considered to be basic, and in which (as in generative studies) consequently a main stress rule is operative. Following this line of thought we come close to the third approach mentioned in the first section of this paper (cf. 1.1), i.e. the approach defended by Van Wijk (1939) and De Groot (1968), who regard Dutch as a 'free-stress' language.

At this stage a further specification of the notion 'free-stress' language is in order. First of all it is important to note that the notion 'free-stress' language does not imply that in such a language the position of MS is entirely arbitrary and unsystematic. Van Wijk and De Groot explicitly use this term only to distinguish languages in which MS can occupy a variety of positions in the word – i.e. in which MS is not committed to a fixed place with respect to the beginning or end of the word – from those languages in which MS occupies an invariable position. According to De Groot (1968: 210, 215), Hungarian is a language which belongs to the latter: as a rule it is the first syllable of the word which bears MS. For Dutch, however, such a fixed regularity cannot be ascertained, compare *'arbeid* 'work' vs. *ha'bijt* 'habit', *'kolibrie* 'humming-bird' vs. *ad'hesie* 'support' vs. *ener'gie* 'energy', etc. (cf. 3.2). On the basis of these preliminary remarks on 'free-stress' languages, the following tentative conclusions can be formulated: (1) In a 'free-stress' language, too, the position of MS may be rule-governed – e.g. the position of MS may be dependent on the segmental structure – , and (2) the variation in stress contours by which the so-called 'free-stress' languages are characterized may be the result of *various* factors, i.e. it is not necessarily the case that in every 'free-stress' language an identical factor accounts for the variable position of MS within the word.

In this paper it will be suggested that modern Dutch should indeed be looked upon as a 'free-stress' language, i.e. a language in which MS does not occupy a fixed position with regard to the beginning or end of the word. The factor underlying this variable position of MS is the fact that in Modern Dutch at least two, partly competing, stress patterns occur. Typical of such a situation is not that the patterns themselves are arbitrary (in the sense of 'lacking any phonetic motivation') or unsystematic, but that above all things it is more or less unpredictable which stress pattern belongs to which word.

### 3.2 Unpredictable stress patterns

As hinted above, it is typical of a 'free-stress' language in which two or more competing stress patterns are operative, that in most cases it is impossible to predict with complete certainty which stress pattern has to be assigned to which word. Dutch examples such as '*canon*' 'canon' vs. *ka'non* 'gun', '*Kanton*' vs. *kan'ton* 'canton', '*kokos*' 'coconut' vs. *ko'los* 'colossus', '*kolibrie*' 'humming-bird' vs. *ad'hesie* 'support' vs. *ener'gie* 'energy', '*podagra*' 'id.' vs. *go'rilla* 'id.' vs. *choco'la* 'chocolate', '*olifant*' 'elephant' vs. *foli'ant* 'folio', '*Wijnand*' 'id.' vs. *ga'lant* 'gallant', etc. illustrate this. Thus, the unpredictability of the position of MS seems to support the stand taken in Van Marle (1978a) that all words constituting the content of the lexicon – and, of course, simplex words belong to this group – are fully specified. As a consequence, *all* Dutch simplex words have to be listed with fully specified stress patterns. This view leads to an analysis that is quite different from the usual way in which stress phenomena are dealt with in the standard version of generative grammar.

Even though the mapping of stress contours on to the words in question is highly unsystematic, this does not imply that the stress pattern of each word is unpredictable to the same degree. Within the two stress patterns which I claim to hold for Modern Dutch, certain systematic factors can be distinguished, notably those referring to the segmental structure. An indication of the different degrees in predictability of the position occupied by MS is the following.

In some words the position of MS is completely predictable, e.g. in bisyllabic words containing a shwa. If the first syllable contains a shwa, MS is borne by the second syllable, whereas the first syllable bears MS if the second contains a shwa. In the majority of the bisyllabic words without shwa, however, the position of MS cannot be predicted with the same certainty. Compare: '*nylon*' 'id.' vs. *sa'lon* 'drawing-room'; '*Wijnand*' 'id.' vs. *ga'lant* 'gallant', etc. (see above).

Although only a few of the regularities involved in the stress assignment in Dutch simplex words are of such an absolute nature as the influence exercised by shwa, this does not mean that these regularities play no role of any importance in the 'living' structure of Modern Dutch. For it is precisely these regularities which appear to underlie many of the stress shifts mentioned in 2.1 and 2.2 (cf. section 5). This implies that we have to find the means to express all the regularities that are in force, since only in this way can we obtain a basis for the explanation of the various stress shifts which have taken place (and are still taking place) in Dutch.

As a result of the absence of (among other things) a sharp differentiation between the stress phenomena in simplex and complex words – the so-called ‘main stress rule’ figuring in so many generative studies operates in both fields! (cf. 1.1) –, generative grammarians working on stress phenomena have not been able to take advantage of some ideas developed in other domains of the study of natural language. I allude here to the insight not to interpret all proposed rules as mechanisms that actually *generate* the forms at issue, but to regard these rules as *statements* concerning the predictable aspects of these forms, i.e. as rules of a strictly analyzing nature. In the domain that is traditionally referred to as ‘morpheme structure’ this interpretation has been well-established in the theory as early as Stanley (1967), compare the introduction of the so-called ‘morpheme structure *conditions*’. In the field of morphology this analytical approach has been explicitly defended in studies such as Vennemann (1974), and Jackendoff (1975). This paper suggests an extension of this procedure of interpreting certain rules as statements specifying the systematic aspects of the forms at issue to the field of stress phenomena in simplex words. That is to say, all patterns – purposely I have refrained from using the term ‘rule’ in the above – which specify the regularities in the stress contours of Dutch simplex words to be discussed below should be regarded as *redundancy rules* in the sense of Jackendoff’s ‘full entry theory’, i.e. as rules which analyze the fully specified simplex words in the lexicon.

### 3.3 *The basic patterns in Dutch*

#### 3.3.1 *The ‘stress-initial’ pattern*

From the data in 2.2 it becomes clear that for Modern Dutch a ‘stress-initial’ pattern can still be motivated. The claim implied by such a pattern is that, as a rule, MS is located on the first syllable of the word unless this syllable contains a shwa.<sup>9</sup> Schematically this pattern can be represented as follows:<sup>10</sup>

$$\begin{array}{ccccccc}
 (14) & \# & (S) & S & S_O & \# \\
 & & | & \downarrow & & \\
 & & \sigma & \text{MS} & & 
 \end{array}$$

According to this pattern, the following simplex words are stressed:

- (15) (a) all monosyllabic words: ‘*aa*’ ‘stream’, ‘*berk*’ ‘birch’, ‘*ei*’ ‘egg’, ‘*kat*’ ‘cat’, ‘*knoest*’ ‘knot’, etc.

- (b) all bisyllabic words the last syllable of which contains a shwa: 'einde 'end', 'haver 'oats', 'kade 'quay', 'oven 'id.', etc.
- (c) bisyllabic words the second syllable of which contains a lax vowel: 'atlas 'id.', 'koning 'king', 'oorlog 'war', 'vijand 'enemy', 'Wijnand 'id.', etc.
- (d) bisyllabic words the second syllable of which contains a tense vowel or a diphthong: 'altaar 'shrine', 'kenau 'shrew', 'kievit 'peewit', 'lichaam 'body', 'Moskou 'Moscow', etc.
- (e) all bisyllabic words the first syllable of which contains a shwa: be'roep 'profession', be'stek 'cutlery', ge'lei 'aspic', ge'wei 'antlers', etc.
- (f) words consisting of more than two syllables, the last of which contains a lax vowel: 'kakkerlak 'cockroach', 'ulevel 'lozenge', 'weduwe 'widow', 'zwezerik 'thymus', etc.
- (g) words consisting of more than two syllables, the last of which contains a tense vowel or a diphthong: 'algebra 'id.', 'Feyenoord 'id.', 'majesteit 'majesty', 'ooievaar 'stork', 'selderij 'celery', 'wiele-waal 'golden oriole', etc.

### 3.3.2 The 'stress-final' pattern

3.3.2.1 *Final syllable stress.* It is clear that the advocates of the 'stress-final' approach base their arguments on data which are on the whole of a nonnative – i.e. Romance – origin. Booij (1977: 61), for instance, stresses this point. At the same time, he points out that the words at issue can no longer be regarded as nonnative in a synchronic analysis of Modern Dutch. Even if we assume that Booij's claim is correct – in fact, in many cases it is extremely difficult to determine whether a word should be considered native or nonnative – it is by no means surprising that a stress rule of the 'romance' type is needed to account for the words which, from a diachronic point of view, have been borrowed from French (or other Romance languages). Following this line of reasoning, the following patterns can be motivated for Dutch:<sup>11</sup> (cf. 3.3.2.2).

$$\begin{array}{c}
 (16) \# S_O S (S) \# \\
 \quad \downarrow \quad | \\
 \quad \quad \sigma \quad \sigma \\
 \text{MS}
 \end{array}$$

This means that, according to (16), the final syllable bears MS – hence the style 'final syllable' stress –, unless this syllable contains a shwa. In this way the correct stress pattern of the following classes of words can be

predicted (cf. note (17) for monosyllables):

- (17) (a) bisyllabic words ending in a vowel other than *ə*: *bou'gie* 'spark-plug', *bu'reau* 'desk', *cha'let* ([*ʃa'le*]), 'id.', *da'da* 'id.', *pu'ree* 'mash', *re'çu* 'receipt', *ta'boe* 'taboo', etc.
- (b) bisyllabic words ending in a diphthong: *kan'dij* 'candy', *kar'bouw* 'buffalo', *kar'wei* 'chore', *lan'douw* 'field', etc.
- (c) bisyllabic words ending in a lax vowel followed by at least one consonant: *a'larm* 'id.', *al'bast* 'alabaster', *ba'rak* 'barracks', *ba'rok* 'baroque', *bor'des* 'steps', *han'sop* 'sleeping-suit', *ho'tel* 'id.', *ka'lot* 'skull-cap', *ka'non* 'gun', *ka'raf* 'decanter', *ma'tras* 'mattress', *ro'man* 'novel', *sma'ragd* 'emerald', *va'zal* 'vassal', etc.
- (d) bisyllabic words ending in a tense vowel or a diphthong followed by at least one consonant: *a'ffuit* 'gun-carriage', *a'kkoord* 'agreement', *Al'giers* 'id.', *ba'naan* 'banana', *flu'weel* 'velvet', *ha'bijt* 'habit', *he'raut* 'herald', *ka'poen* 'capon', *o'deur* 'perfume', *par'kiet* 'parakeet', *si'roop* 'sirup', *ta'lud* 'talus', etc.
- (e) words consisting of three or more syllables, and ending in a vowel: *cana'pé* 'sofa', *choco'la* 'chocolate', *ener'gie* 'energy', *par've'nu* 'upstart', etc.
- (f) words consisting of three or more syllables, and ending in a lax vowel followed by at least one consonant: *basi'lisk* 'id.', *dia'lekt* 'dialect', *eti'ket* 'label', *kamele'on* 'cameleon', *kata'falk* 'catafalque', *kroko'dil* 'crocodile', *ledi'kant* 'bedstead', *muske'ton* 'snap', *per-ka'ment* 'parchment', etc.
- (g) words consisting of three or more syllables, and ending in a tense vowel or a diphthong followed by at least one consonant: *abri'koos* 'apricot', *aco'liet* 'acolyte', *acro'baat* 'acrobat', *admi'raal* 'admiral', *anako'loet* 'anacoluthon', *anti'loop* 'antelope', *carga'door* 'ship-broker', *kampi'oën* 'champion', *kapi'teel* 'capital', *locomo'tief* 'locomotive', *meridi'aan* 'meridian', *pleisto'ceen* 'pleistocene', etc.
- (h) words the final syllable of which contains a shwa: *a'mandel* 'almond', *amba'ssade* 'embassy', *anek'dote* 'anecdote', *je'never* 'genever', *ka'rakter* 'character', *o'ranje* 'orange', *'page* 'footboy', *pa'rade* 'id.', *ra'barber* 'rhubarb', *syna'goge* 'synagogue', etc.

3.3.2.2 *Penultimate stress*. Note that the two patterns discussed so far – i.e. the 'stress-initial' pattern and final syllable stress – are by no means sufficient for a correct account of the stress contours of Dutch simplex words. At this point we are confronted with at least two problems:

(i) A rather large class of words consisting of three or more syllables display a stress pattern that is neither in conformity with the 'stress-initial', nor with the 'stress-final' pattern as they were formulated in the preceding sections.

(ii) A relatively large proportion of the stress shifts mentioned in 2.1 is left completely unexplained within the framework set up so far.

Let us analyze these problems in somewhat greater detail.

A number of words bear MS on their penultimate syllable. This stress pattern seems to occur particularly frequently in words ending in a vowel (other than shwa, of course; cf. 3.3.2.1 and below), or in a lax vowel followed by a consonant. Compare the following examples:

(18) (a) words of three or more syllables, and ending in a vowel: *ad'hesie* 'support', *a'rena* 'id.', *bo'dega* 'id.', *go'rilla* 'id.', *Papia'mento(e)* 'id.', *pi'ano* 'id.', *sa'lami* 'id.', *vermi'celli* 'id.', etc.

(b) words of three or more syllables, and ending in a lax vowel followed by a consonant: *antima'kassar* 'antimacassar', *Ce'lebes* 'id.', *ka'nunnik* 'canon (rel.)', *kasu'aris* 'cassowary', *Pa'lembang* 'id.', *pro'fessor* 'id.', *syn'taxis* 'id.', etc.

Perhaps even more important is the fact that the outcome of many of the stress shifts and mispronunciations discussed in 2.1 is in conformity with this penultimate stress pattern. The following well-known mispronunciations and examples from colloquial Dutch illustrate this (cf. 2.1):

(19) <i>a'libi</i>	'id.'	(instead of 'alibi)
<i>Ar'kansas</i>	'id.'	(instead of 'Arkansas)
<i>depo'sito</i>	'deposit'	(instead of <i>de'posito</i> )
<i>gene'rative</i>	'id.'	(instead of 'generative)
<i>inte'resting</i>	'id.'	(instead of 'interesting)
<i>Nia'gara</i>	'id.'	(instead of <i>Ni'agara</i> )
<i>pa'gina</i>	'page'	(instead of 'pagina)

The same preference of the penultimate stress contour can be deduced from the renderings of Turkish and Javanese words by native speakers of Dutch (cf. (9) and note 3).

These facts seem to suggest that, besides final syllable stress (cf. 3.3.2.1), a penultimate pattern can be motivated for present-day Dutch. Schematically this can be represented as follows:

(20) #  $S_0$  S S #  
           ↓  
           MS



Clearly, if both (16) and (20) figure in an analysis of Modern Dutch, (16) can be represented as follows:

$$(21) \# S_O \quad S \quad \#$$

$$\downarrow$$

$$MS$$

All words stressed by (16) the last syllable of which contains a shwa show penultimate stress. It is precisely this stress contour that is specified by (20). In this way the emendation of (16) results in the entire specification of penultimate stress by (20) (cf. 4.1), and of final syllable stress by (21).

3.3.2.3 *Antepenultimate stress.* Besides final syllable and penultimate stress, a third stress pattern can be distinguished in which the end of the word determines the position of MS: antepenultimate stress. This pattern can be represented as follows:

$$(22) \# S_O \quad S \quad S \quad S \quad \#$$

$$\downarrow$$

$$MS$$

Examples of this stress pattern are:

- (23) (a) words ending in a vowel other than shwa: *a'cacia* 'id.', *a'linea* 'paragraph', *fac'simile* 'id.', *in'cognito* 'id.', etc.  
 (b) words ending in a shwa: *A'rabië* 'Arabia', *Argen'tinië* 'Argentina', *Nor'mandië* 'Normandy', *Roe'menië* 'Rumania', etc.  
 (c) words ending in a consonant: *a'crostichon* 'acrostic', *ar'senicum* 'arsenic', *a'syndeton* 'id.', *ca'talogus* 'catalogue', *di'eresis* 'id.', *e'meritus* 'id.', *e'pentthesis* 'id.', *Ga'lapagos* 'id.', *hippo'potamus* 'id.', *idi'oticon* 'id.', *patri'monium* 'patrimony', *pe'troleum* 'id.', *prog'nosticen* 'id.', *ri'noceros* 'rhinoceros', *stradi'varius* 'id.', etc.

### 3.3.3 The 'stress-initial' versus the 'stress-final' pattern

From the previous sections it will be clear that the difference between the 'stress-initial' and the 'stress-final' pattern is based on whether MS is defined with respect to the beginning or the end of the word. Thus, in the case of final syllable, penultimate, and antepenultimate stress — i.e. the 'stress-final' pattern —, MS is defined with respect to the end of the word, while the beginning of the word is crucially involved in the 'stress-initial' pattern.

In the following section a further argument will be presented for the

grouping together of final syllable, penultimate, and antepenultimate stress under one denominator, i.e. the 'stress-final' pattern. This will constitute further evidence for the 'two pattern' approach as motivated in this section (cf. 4.2).

#### *4. The 'stress-initial' versus the 'stress-final' pattern: a further delimitation*

##### *4.1 The role of the segmental structure*

So far, little attention has been paid to the influence of the segmental structure on accentuation in any systematic way. This, however, by no means implies that the segmental structure is considered to be irrelevant for the determination of MS in Dutch.

Let us take a simple example to start with. As will be clear from the foregoing (cf. 3.2), in the class of bisyllabic words ending in a lax vowel followed by at least one consonant, both word-initial and word-final stress can be found. Compare: *'asbest* 'asbestos' vs. *mo'lest* 'id.', *'Kanton* vs. *kan'ton* 'canton', *'kokos* 'coconut' vs. *ko'los* 'colossus', *'nylon* 'id.' vs. *sa'lon* 'drawing-room', *Wijnand* vs. *ga'lant* 'gallant', etc. If, however, a bisyllabic word ends in a syllable that contains a shwa, only word-initial stress – which in this case, of course, coincides with penultimate stress (cf. 4.3.1) – occurs, due to the fact that shwa can never bear MS. So in this case the segmental structure determines whether or not a certain stress contour occurs.

Not all instances in which the segmental structure plays a role in the accentuation of simplex words have such an absolute character as the influence exercised by shwa mentioned above. In Booij (1977: 59-60) it is claimed that on the whole words ending in a vowel are stressed on the penultimate (cf. the emendation of the context-specification introduced in rule (1) vis-à-vis rule (2)). Although Booij's general claim may be right, – within the limited scope of this paper I cannot go into this matter in detail –, it is obvious that quite a large number of exceptions exist (cf. (17a) and (17e)). What is more, Booij's claim that words ending in a vowel are 'normally' stressed on the penultimate may be justified for some vowels, but it is questionable whether *all* vowels agree with it to the same extent, and for some vowels this claim may even be incorrect. Words ending in a stressed *a*, for example, hardly ever occur. Thus, on the one hand this means that these words present evidence for the overall correctness of

Booij's claim. On the other hand, however, words ending in *e* are almost always stressed on their final syllable, that is, the stress pattern of this subset of words ending in a vowel is diametrically opposed to the structure which Booij claims to hold for Dutch. Compare: *cana'pé* 'sofa', *dia'rree* 'diarrhoea', *ha'chee* 'hash', *i'dee* 'idea', *mati'nee* 'id.', *pana'cee* 'panacea', *pu'ree* 'mash', *pyg'mee* 'pygmy', *tour'nee* 'tour', *tro'fee* 'trophy', etc.

Thus, the question naturally arises which framework will best accommodate these regularities. Or, in other words, what means do we have at our disposal to express that (i) bisyllabic words the second syllable of which contains a shwa, are stressed on their first syllable without exception, (ii) words ending in *a* are 'normally' stressed on their penultimate, and (iii) the overwhelming majority of words ending in *e* are stressed on the final syllable? The solution I would like to propose is the following:

- (24) (A) For a correct assignment of MS in Dutch simplex words, at least the following stress patterns should be distinguished:
- (i) the 'stress-initial' pattern (cf. (14)); and
  - (ii) the 'stress-final' pattern which comprises final syllable stress (cf. 3.3.2.1), penultimate stress (cf. 3.3.2.2), and antepenultimate stress (cf. 3.3.2.3).
- (B) Like the 'positive conditions' which Aronoff (1976: 62-63) proposes to determine the productivity of the rules of word formation, I suggest that each pattern may be linked to a number of conditioning factors which indicate the measure of probability with which one can determine which stress pattern belongs to which word.

It is clear that the conditioning factors mentioned in (24, B) can — among other things — have a bearing on the segmental structure of the words at issue. Given these premisses, the three tentative regularities discussed above can be represented as follows:

- (25) (a) #  $S_O$   $S$   $S$  # (cf. (20); penultimate stress)

↓  
MS

(b) *conditioning factors*

(i)  $S$  #

|  
*a*

- (26) (a) #  $S_O$   $S$   $S$  # (cf. (20); penultimate stress)

↓  
MS

(b) *conditioning factors*

(i) S #

|

*a*

(27) (a) # S<sub>O</sub> S # (cf. (21); final syllable stress)

↓

MS

(b) *conditioning factors*

(i) S #

|

*e*

As in Aronoff's theory of morphology (cf. Aronoff 1976: 63), in an elaborated theory of word stress each conditioning factor should be linked to an 'index' which specifies the relative 'power' it displays. Thus, some of the conditioning factors are of an absolute nature, i.e. they do not allow exceptions, whereas others are not.

As far as bisyllabic words are concerned the conditioning factor operative in (25), for example, belongs to the former – no exceptions can be found –, whereas the conditioning factors in both (26) and (27) are of a clearly non-absolute nature. I.e., the conditions in (26) and (27) appear to imply that words ending in *a* are 'normally' stressed on their penultimate, and that the words ending in *e* 'normally' bear MS on their final syllable. In this way it has become possible to express the fact that words which are stressed in conformity with the conditions linked to their stress pattern, possess more predictable properties than words that are not.

It may be useful at this point to provide some illustrations. The penultimate stress displayed by words such as *bo'dega* and *'Inca* is in conformity with one of the conditioning factors associated with this stress pattern (cf. (26)). This is not the case in the stress pattern of words such as *choco'la* and *da'da*, however. In these words the position of MS is not specified by any of the conditioning factors of the stress pattern to which these words have to be related, i.e. final syllable stress. This means that the stress contours of *bo'dega* and *'Inca* possess more predictable properties than those of *choco'la* and *da'da*.

In the same way the stress patterns displayed by *'aloë* and *'toffee* possess less predictable properties – since both have to be related to the 'stress-initial' pattern – than those of *chimpan'see* 'chimpanzee' and *tro'fee* 'trophy', as the final syllable stress found here is specified by one of the

conditioning factors associated with this pattern (cf. (27)).

Given this outline, it may be useful at this point to introduce the notion 'preferred stress pattern'. If there are indications that a certain segmental configuration is 'normally' or 'preferably' associated with a certain stress contour, we are dealing with a 'preferred stress pattern'. To return to the examples mentioned above: *bo'dega* and *'Inca* are in conformity with the preferred stress pattern that words ending in *a* are normally stressed on their penultimate, while *choco'la* and *da'da* are not. Similarly, *chim-pan'see* and *tro'fee* agree with the preferred stress pattern that word-final *e* is normally stressed, whereas *'aloë* and *'toffee* do not agree.

Given this way of determining the degree of probability with which a certain stress pattern can be associated with a given word, the question may arise whether and to what extent features such as [+ Latin], the so-called 'stratal' features, can figure as the conditioning factors which are linked to the various stress patterns. Although I did not study this topic in any detail – consequently my remarks can be of a tentative nature only – I would like to point out the following. Unlike Booij (1977: 66-67), it seems to me highly unlikely that only *one* pattern, i.e. the penultimate pattern, can be assumed to hold for all the words of a presumed [+ Latin] character. Within this 'one pattern approach' for [+ Latin] words, Booij (1977: 67) proposes the rule of (28):<sup>12</sup>

$$(28) \quad V \rightarrow [1 \text{ stress}] / [X \left[ \begin{array}{c} \text{---} \\ + \text{ Latin} \end{array} \right] C_O \quad V C_O \left( \left[ \begin{array}{c} V \\ \left\{ \begin{array}{l} [-\text{high}] \\ [+ \text{round}] \end{array} \right\} \end{array} \right] C_O \right) ]_N$$

Note, however, that this rule is incorrect for a relatively large class of [+ Latin] words. Words ending in *um*, for example, the penultimate syllable of which contains a vowel other than *i*, are usually stressed on their penultimate, and not – as is specified by rule (28) – on their antepenultimate (cf. Blancquaert 1969: 172-173). Compare: *curi'osum*, *de'corum*, *la'barum*, *ly'ceum*, *mu'seum*, *uni'versum*, *vade'mecum*, etc.<sup>13</sup>

This means that within the class of [+ Latin] words both penultimate and antepenultimate stress can be found, and that the choice between these two patterns is entirely determined by the segmental structure. If a word ends in *um*, the antepenultimate usually bears MS when the penultimate contains an *i*; if the penultimate, however, contains a vowel other than *i*, it is this syllable itself on which MS is mostly located. This indicates that the 'one pattern approach' – within which features such as [+ Latin] play such a crucial role – is inappropriate for the correct account of the stress contours of the words at issue. Facts like these seem to suggest that

within the domain of stress phenomena of Dutch simplex words it is primarily the segmental structure which determines which stress pattern is operative, and that the so-called 'stratal features' play a part of secondary importance at best.

## *4.2 The 'stress-final' pattern*

### *4.2.1 Introduction.*

Since for final syllable, penultimate, and antepenultimate stress the end of the word is the determining factor for the correct assignment of MS, these patterns have been grouped together under the heading of the 'stress-final' pattern (cf. 3.3.3). In this section I shall determine to what extent these three stress contours are in mutual competition. In other words, this section will be concerned with the further mutual delimitation of these three stress patterns. The exposition of this section will run as follows: in 4.2.2 the interaction between penultimate and final syllable stress will be discussed, while 4.2.3 will be concerned with the interaction between antepenultimate stress on the one hand, and final syllable and penultimate stress on the other.

### *4.2.2 Final syllable versus penultimate stress*

In order to investigate the actual competition between the final syllable and the penultimate pattern, it will be useful to divide Dutch simplex words into the following three classes:

- A words ending in a vowel (cf. 4.2.2.1);
- B words ending in a lax vowel followed by at least one consonant (cf. 4.2.2.2), and
- C words ending in a tense vowel or diphthong followed by at least one consonant (cf. 4.2.2.3).

*4.2.2.1 Words ending in a vowel.* As hinted above, some vowels preferably never bear MS when they are in word-final position, while others do. For example, *a* belongs to the former class, and *e* to the latter (cf. 4.1). This means that if such a preference for the presence or absence of MS can be motivated, there is no question of a real, large-scale competition between the relevant 'stress-final' patterns at issue. In fact, in such a case this competition is limited to the forms that are not in conformity with the preferred stress pattern at issue. Compare the following example. As was

pointed out above, words ending in *a* are preferably stressed on their penultimate (cf. 4.1). This means that on the whole these words fall outside the scope of the competition between the final syllable and the penultimate stress pattern, except for the few words that are not in conformity with the preferred stress pattern, i.e. which are stressed word-finally: *be'ha* 'bra', *choco'la* 'chocolate', *da'da* 'id.', *ma'ma* 'mummy', *pa'pa* 'daddy', *Zo'la* 'id.'.

It is interesting that in colloquial Dutch some of these words (notably *da'da*, *ma'ma* and *pa'pa*) are nearly always pronounced with MS on the first syllable, a rendering which constitutes evidence for the actual competition between the two patterns.

The above does not imply, of course, that *all* words ending in a vowel can simply be removed from the domain of competition between the three stress patterns just because preferred stress patterns can be motivated for all word-final vowels. A well-known crux, for example, is the accentuation of words ending in *i* (often spelled *ie*) (cf. Blancquaert 1969: 171-172). Although I have not studied this topic in any detail, my first impression is that it will be difficult – especially in words consisting of three or more syllables – to determine which is the preferred stress pattern in this case. Yet, although both final syllable and penultimate stress can often be found, it cannot be denied that in words ending in *i* stress shifts to the penultimate quite frequently occur – even in words which were originally stressed word-finally! – whereas a shift of MS to the final syllable hardly ever occurs. Compare *am'fibie* 'amphibian' for *amfi'bie*, *hege'monie* 'hegemony' for *hegemo'nie*, etc. (2.1, 5.2-5.4). This may indicate that it is penultimate stress which is the preferred stress pattern for this class of words.

*4.2.2.2 Words ending in a lax vowel followed by at least one consonant.* The strategy outlined in the previous section ran thus: to conclude whether there is an actual competition between the relevant types of 'stress-final' patterns, the segmental structure is investigated with a view to the existence of so-called preferred stress patterns. If such a preferred stress pattern can be shown to exist, the actual competition is restricted to the forms which are not in conformity with this pattern. Although I do not wish to claim that a 'real' competition between final syllable and penultimate stress does not exist, I believe that a detailed investigation of the segmental phenomena will reveal certain regularities – unnoticed thus far – to indicate that preferred stress patterns do occur indeed. In this way the competition between the patterns is further reduced, and the patterns as such are

defined in a more precise way.

Let me illustrate this with the following example. In traditional studies of Dutch word stress, a rule has been formulated that words ending in two consonants are generally stressed word-finally (cf. Blancquaert 1969: 171). Although this statement may on the whole be correct, some word-final consonant clusters seem to deviate from this rule. The overwhelming majority of bisyllabic words ending in *ks* (often spelled *x*), for example, are stressed word-initially. Compare: *'climax* 'id.', *'codex* 'id.', *'feniks* 'phoenix', *'lariks* 'larch', *'larynx* 'id.', *'telex* 'id.', *'thorax* 'id.', etc., and recently coined trade-marks such as: *'Atrix*, *'Bambix*, *'Bendix*, *'Durex*, *'Elmex*, *'Pyrex*, *'Rutex*, *'Simplex*, *'Tampax*, etc. This consistent stress contour of bisyllabic words ending in *ks* indicates that a preferred stress pattern is in force which in bisyllabic words ending in *ks* specifies the first syllable as the one which bears MS.<sup>14</sup> From the existence of such a preferred stress pattern it follows that on the whole, i.e. save exceptions such as *a'nnex* 'id.', *com'plex* 'id.', *per'plex* 'stunned', the words at issue are excluded from any competition between the relevant stress patterns. The shift from final to initial stress in words such as *'affix*, *'infix*, *'prefix* and *'suffix* confirms that the exceptions to this preferred stress pattern do participate in the competition between the word-initial and the word-final stress contour (cf. (12b)).

Further investigation will have to reveal whether other preferred stress patterns can be found in the class of words ending in a lax vowel followed by one consonant (cf. 5.2, 5.4).

*4.2.2.3 Words ending in a tense vowel or a diphthong which is followed by at least one consonant.* In connection with words ending in a tense vowel or diphthong followed by at least one consonant, it is sufficient to mention that traditionally this class of words is regarded as 'normally' stressed word-finally (cf. Blancquaert 1969: 171-172). As far as I am concerned, it is unclear whether part of the exceptions to this general statement can be explained in terms of a preference of one or the other 'word-final' stress pattern. Indications of the close relation between final syllable stress and the nature of the vowel in the last syllable, however, do exist. For some stress shifts cast an interesting light on the interdependence of stress contour and vowel quality. The word *samovar*, for example, has at least the following three pronunciations: besides the 'original' *'samovar*, the renderings *'samovaar* and *samo'vaar* are heard.<sup>15</sup> Interestingly, the tensing of the vowel in the final syllable (cf. tense [a] in the final syllable of *'samovaar* with lax [α] in the same position) is followed by the shift of MS



to this syllable (cf. *samo 'vaar*).<sup>16</sup>

Another indication of this interdependence of stress pattern and vowel quality can be found in some words of Arabic origin. In Dutch, many of these words are pronounced both with word-initial, and with word-final stress (cf. 12c)). Compare: *'Amman* vs. *A'mman*, *'koraan* vs. *ko'ran*, *'Ramadan* vs. *Rama'dan*, *'Soedan* 'Sudan' vs. *Soe'dan*, etc. Significantly, in these examples the vowel of the final syllable is lax ([ $\alpha$ ]) when the first syllable bears MS, whereas this vowel is tense ([ $a$ ]) when these words are stressed finally.

As far as the traditional claim as to the preferred final syllable stress of the words at issue is correct, the words of which the second syllable contains a tense vowel or a diphthong in (10a), e.g. *'altaar*, *'arbeid*, *'kalief*, *'kievit*, and *'lichaam*, should be regarded as exceptional.

**4.2.2.4 Conclusions.** Although the survey of the competition between penultimate and final syllable stress in 4.2.2.1-4.2.2.3 is no doubt inaccurate in many ways, the following tentative conclusions may be drawn:

- (i) In some cases penultimate and final syllable stress may be in true competition.
- (ii) However, in other cases (and this, I gather, concerns the majority of cases) so-called 'preferred stress patterns' can be discerned. By this I understand that the segmental structure determines which of the two patterns is the 'normal' one. This preference is expressed by the elimination of the forms that are exceptional to these canonical stress patterns. If such a preferred stress pattern can be found, there is no question of a competition between the two patterns — save the exceptions —, since in this case a kind of 'complementary distribution' relation holds.

#### 4.2.3 The range of antepenultimate stress

A remarkable aspect of antepenultimate stress is the quite restricted scope of its distribution. To be sure, antepenultimate stress occurs both in words ending in a vowel, and in a consonant (cf. 3.3.2.3), but the segmental configurations which specify the preferred antepenultimate stress patterns do not only relate to the final syllable, but also to the penultimate.

According to Blancquaert (1969: 173), one of the classes of words in which antepenultimate stress prevails is constituted by the words ending in *a*, *o*, *um*, and *us*, and the penultimate syllable of which contains an *i*. Within the framework developed above, this can be represented as follows:

(29) *antepenultimate stress*

(a) #  $S_O$   $S$   $S$   $S$  #  
           ↓  
           MS

(b) *conditioning factors*

(i)  $S$   $S$  #  
      | |  
      *i*  $\left\{ \begin{array}{l} a \\ o \\ um \\ us \end{array} \right\}$

The fact that the segmental configurations specifying the preferred penultimate stress pattern refers both to the final and the penultimate syllable seems to be a characteristic of antepenultimate stress in general (cf., however, 5.5). Other contexts in which antepenultimate stress seems to prevail are the words ending in *(th)esis*, and *ië* (cf. Blancquaert 1969: 173), endings which due to their bisyllabic nature, comprise both the final and the penultimate syllable. Compare: *e 'pentthesis*, *me 'tathesis*, *pa 'renthesis*, *'prothesis*; *a 'faeresis*, *'genesis*, *'nemesi*s; *A 'rabië*, *Nor 'mandië*, *Roe 'menië*, *Si 'ci-lië*.

Given the correctness of these cases, (29) can be extended as follows:

(30) *antepenultimate stress*

(a) #  $S_O$   $S$   $S$   $S$  #  
           ↓  
           MS

(b) *conditioning factors*

(i)  $S$   $S$  #  
      | |  
      *i*  $\left\{ \begin{array}{l} a \\ o \\ um \\ us \end{array} \right\}$

(ii)  $S$   $S$  #  
      |  $\uparrow$   
      *e* *sis*

(iii)  $S$   $S$  #  
      | |  
      *i*  $\emptyset$

The immediate consequence of this limited distribution of antepenultimate stress is that the competition between this pattern on the one hand, and final syllable and penultimate stress on the other is of a quite restricted nature, too. For the existence of these very specific preferred antepenultimate stress patterns implies that between antepenultimate

stress on the one hand, and the other instances of the 'stress-final' pattern on the other, on the whole a complementary distribution relation holds. The fact that in general the three subtypes of the 'stress-final' pattern seem to be in complementary distribution constitutes another argument for grouping these together, and for opposing them to the 'stress-initial' pattern (cf. 4.3).

### 4.3 *The interaction between the 'stress-initial' and the 'stress-final' pattern*

#### 4.3.1 *The overlap between the two patterns*

In this section the competition between the 'stress-initial' and the 'stress-final' patterns will have to be determined. First of all it should be emphasized that — given the notion of 'preferred stress pattern' as defined in 4.1 — these two patterns do not compete in all cases, as certain groups of words display stress contours which can be related to both the 'stress-initial' and the 'stress-final' pattern. Compare the following cases:

- (i) Bisyllabic words the first syllable of which bears MS can be associated with the 'stress-initial' pattern and the 'stress-final' pattern, i.e. penultimate stress, as well.
- (ii) Trisyllabic words which are stressed on their first syllable can be related to both patterns, too, i.e. to the 'stress-initial' pattern and to antepenultimate stress of the 'stress-final' pattern.

Although it is not my intention to deny that a certain overlap exists between the 'stress-initial' and the 'stress-final' patterns, I believe that the notion of 'preferred stress pattern' can be defined in a more restrictive way, as a result of which the overlap between the two patterns can be stated more accurately.

As will be clear from the foregoing, the bisyllabic words ending in *ks* (cf. 4.2.2.2) can be related to both the 'stress-initial' — bisyllabic words ending in *ks* are preferably stressed on their first syllable —, and the 'stress-final' pattern, i.e. as a case of penultimate stress (cf. 'bisyllabic words ending in *ks* are preferably stressed on their penultimate'). What appears to be questionable here is the relation between the words at issue and the penultimate stress contour. For what is the case? In words ending in *ks* which consist of at least three syllables, there is nothing that might indicate that it is the penultimate which is preferably stressed. In fact, penultimate stress is extremely rare in these words (cf. the 'unique' *a'ppendix* 'id.')., whereas both the first and the last syllable can often be found bearing MS. Compare: *'crucifix*, *'multiplex*, *'pontifex*, etc., and *Bene'lux*,

*circum'flex*, *para'dox*, etc., respectively. Recently coined trade-marks are usually stressed on their first syllable, e.g. *Biotex*, *Conimex*, *Dulcolax*, *Duralex*, *Isolex*, *Moulinex*, *Odorex*, *Tubifex*; final syllable stress is displayed by *Capi'lux*, where *ks* is preceded by a tense vowel.

This implies that, given these data, it seems to be ill-advised to relate bisyllabic words ending in *ks* to the penultimate pattern, since in words ending in *ks* which consist of more than two syllables penultimate stress is hardly ever found. From this it follows that the bisyllabic words should be associated with the 'stress-initial' pattern only.

Quite different, however, is the following case. As will be clear from the the previous sections, trisyllabic words ending in *a* the penultimate of which contains an *i* can be related to the 'stress-initial' pattern and to antepenultimate stress as well. Compare: *'Afrika* 'Africa', *'aria* 'id.', *'cavia* 'guinea pig', *'gloria* 'id.', *'hospita* 'landlady', *'paprika* 'green pepper', *'patina* 'id.', *'varia* 'miscellanies', etc. However, if one considers words which display the same segmental structure, and consist of more than three syllables, exactly the same preference of antepenultimate stress can be observed. Compare: *a'cacia* 'id.', *A'merika* 'America', *be'gonia* 'id.', *gra'mmatica* 'grammar', *har'monica* 'concertina', *hy'draulica* 'hydraulics', *ma'laria* 'id.', etc. So, these words indicate that in this case we are really dealing with a preferred antepenultimate stress pattern. Unlike bisyllabic words ending in *ks*, for which the relation with the penultimate pattern seems to be highly questionable, the association of words such as *'Afrika* with the preferred antepenultimate stress pattern cannot be considered to be an accidental fact.

Given these observations, I should like to suggest the following constraints on the notion 'preferred stress pattern':

- (i) The 'preferred stress patterns' associated with the 'stress-final' patterns (i.e. final syllable, penultimate, and antepenultimate stress) should be operative *irrespective of the number of syllables of the word*.
- (ii) Bi- and trisyllabic words which are stressed word-initially can only be associated with penultimate and antepenultimate stress, respectively, if they conform to one of the 'preferred stress patterns' which specify these stress contours.

Let us now return to the question to what extent the 'stress-initial' and the 'stress-final' pattern overlap. From the two constraints discussed above it follows that this overlap is restricted to those cases where it is possible to relate bisyllabic and trisyllabic words which are stressed word-initially to preferred penultimate or antepenultimate stress patterns.<sup>17</sup>

#### 4.3.2 *The competition between the two patterns*

Given the above preliminaries, we are now able to investigate the actual competition between the two stress patterns in Modern Dutch. This competition appears to boil down to the following cases:

- (A) (1) Bisyllabic words which bear MS on their final syllable.
- (2) Trisyllabic words which bear MS on their final or penultimate syllable, and
- (3) Polysyllabic words which bear MS on their final, penultimate or antepenultimate syllable.

If we disregard the words of which the first syllable contains a shwa, the words described above can only be related to the 'stress-final' pattern. The 'stress-initial' pattern, of course, predicts in all these cases that it is the first syllable which is stressed.

There may be an overlap between the 'stress-initial' and the 'stress-final' pattern. In (1) the 'stress-initial' pattern may overlap with penultimate stress, and in (2) with antepenultimate stress. This is only possible, however, if the word at issue displays a segmental structure which conforms to a preferred penultimate or antepenultimate stress pattern, respectively. If this is the case, there is not only a competition between the 'stress-initial' and the 'stress-final' patterns, but *within* the 'stress-final' pattern as well.

- (B) The competition between the 'stress-initial' and the 'stress-final' pattern can also be observed in bi-, tri-, or polysyllabic words which bear MS on their first syllable.
  - (1) Bi-, tri-, and polysyllabic words which are stressed word-initially may conform to a preferred final syllable stress pattern; and
  - (2) Tri- and polysyllabic words which are stressed word-initially may conform to a preferred penultimate stress pattern; and
  - (3) Polysyllabic words which are stressed word-initially may conform to a preferred antepenultimate stress pattern.

Given this survey of the interaction between the two patterns, the stress shifts in Dutch can now be examined in greater detail.

## 5. Stress shifts in Dutch

### 5.1 Introduction

In this paper the stress shifts discussed in section 2 served as 'substantive evidence' in support of the hypothesis that in Modern Dutch two – partly competing – patterns exist. After Van Lessen Kloeke (1973) and Booij (1977), in 2.1 I presented evidence for the 'stress-final' pattern. At the same time I presented data which (i) (as far as I am aware) had gone unnoticed thus far in any systematic manner, and (ii) unequivocally indicate that the 'Germanic' i.e. 'stress-initial' pattern is still in force in present-day Dutch. These facts led us to the 'two-pattern' hypothesis as worked out in sections 3 and 4.

The stress shifts themselves, however, were hardly examined in any detail. It is in this section that this final task will be performed. For this purpose the data of section 2 are divided into the following three groups:

- (A) MS shifts to the final syllable (cf. 5.2);
- (B) MS shifts to the penultimate (cf. 5.3); and
- (C) MS shifts to the initial syllable (cf. 5.4).

### 5.2 MS shifts to the final syllable

It is clear that the stress shifts to the final syllable of the word constitute but a small proportion of all the stress shifts that have taken place in Dutch. Within the class of words consisting of three syllables or more, I have come across only four examples, i.e. *inter'view* (for *'interview*), *sa-la'mi* (for *sa'lami*), *samo'vaar* (for *'samovar/'samovaar*; cf. 4.2.2.3), and the incorrect rendering of *Gra'mmatik* as *Gramma'tik*. Examples of this shift in bisyllabic words are rare, too, cf. *sa'tee* (for *'satee*), *to'ffee* (for *'toffee*), Van Lessen Kloeke's example *Stock'holm* (for *'Stockholm*), and the incorrect rendering of *'comment* as *co'mment*.

Although this material is far too scanty for any 'generalization', it is interesting to note that these shifts are of the following types:

- (a) three of the above-mentioned examples end in a tense vowel followed by a consonant or a glide, cf. *Gramma'tik*, *inter'view*, and *samo'vaar*;<sup>18</sup>
- (b) three examples end in a tense vowel, cf. *sala'mi*, *sa'tee*, and *to'ffee*; and
- (c) two examples end in a lax vowel followed by two consonants. This means that the examples of (a) support the general hypothesis stated in 4.2.2.3 in which final syllable stress was considered to be the preferred

stress pattern for words ending in a tense vowel followed by a consonant. Similarly, two of the examples mentioned in (b), i.e. *sa'tee* and *to'ffee*, are in conformity with the claim in 4.1 that words ending in *e* are preferably stressed on their final syllable.

Hardly any attention has been paid in the above to words ending in a lax vowel followed by two consonants (cf. 4.2.2.2). Traditionally these words are regarded as preferably stressed on their final syllable. Although some consonant clusters deviate from this pattern (cf. 4.2.2.2), the examples of *Stock'holm* and *co'mment* seem to support this view. For words ending in *ent* it is obvious that final syllable stress is the preferred stress pattern. The overwhelming majority of these words bear MS on the final syllable, compare: *a'ccent* 'id.', *a'gent* 'id.', *ce'ment* 'id.', *ori'ent* 'id.', *perka'ment* 'parchment', *pig'ment* 'id.', *resi'dent* 'id.', *turbu'lent* 'id.', etc.

In view of the almost complete lack of bi- or trisyllabic simplex words the last syllable of which contains a lax vowel other than shwa followed by *lm*, the correctness of the traditional view of a preferred final syllable stress pattern is hard to prove in this case.<sup>19</sup>

The rendering of *sa'lami* as *sala'mi* is the other example which cannot simply be related to a preferred stress pattern. It has been argued above that it is questionable whether on the basis of the synchronic materials of Modern Dutch a preferred stress pattern can be set up for words ending in *i*. In this class of words, however, stress shifts to the penultimate seem to occur more frequently than stress shifts to the final syllable. This may indicate that penultimate stress is the preferred stress pattern in this case (cf. 4.2.2.1). Of course it is possible to relate the stress shift in *sala'mi* to the fact that for words ending in *i* a preferred stress pattern is not clearly discernible, but the fact that in this class of words the shift to the penultimate is such a common phenomenon makes this hypothesis somewhat implausible. Another explanation of this rare stress shift might be the following. Because of the fact that in colloquial Dutch MS so often shifts to the penultimate in words ending in *i*, penultimate stress is easily regarded as 'incorrect' in this case.<sup>20</sup> As a consequence, hypercorrection may become operative, the result of which is the overall removal of MS from the penultimate in this class of words. It is by this mechanism that words which were originally stressed on their penultimate may adopt final syllable stress.<sup>21</sup>

Thus, although sweeping generalizations are out of place here, the greater part of the stress shifts to the final syllable seem to follow the general lines set out by the preferred stress patterns.

### 5.3 MS shifts to the penultimate

For cases of MS shifts to the penultimate, I shall confine myself in this section to words consisting of three or more syllables. Bisyllabic words will be discussed in 5.4.

As will be clear from 2.1, stress shifts to the penultimate occur quite frequently. Among other things it was these stress shifts which led Booij (1977) to amend Chomsky & Halle's main stress rule in such a way that penultimate stress was considered to be 'normal' in words ending in a vowel or a shwa optionally followed by a consonant (cf. 1.3). Without denying that in many cases this stress shift to the penultimate does indeed take place in this context, I think it is incorrect to restrict this shift to this environment alone. Firstly, it is highly questionable whether the letter *u* in words such as *kata'logus*, *petro'leum*, etc., represents a shwa,<sup>22</sup> and secondly this shift can also be observed in words ending in a 'full' vowel followed by a consonant. Compare: *Ar'kansas*, *bad'minton*, *gene'rative*, *inte'resting*, *Ke'kkonen*, etc. (cf. (6), (7), and (8)). The same preference of penultimate stress in words ending in a consonant can be observed in some of the Turkish examples mentioned in (9): *diar'bakir*, *Eski'sehir*, *Kara'Deniz*, *Orta'hisar*. Finally, the Javanese place-names mentioned in Ern   (1949: 142) display the same characteristics: *Ge'nengan*, *Ka'dangan*, *We'li'rang* (cf. note 3). It is evident that these phenomena are not in conformity with the structure which Booij (1977) claims to hold for Dutch.

As will be clear from the data presented in 2.1, the shift to the penultimate is quite popular. From all imaginable positions MS can shift to the penultimate. MS has shifted from the antepenultimate (and non-initial) syllable in *norma'liter* and *cata'logus*, from the final syllable in *am'fibie* and *Bo'gota*, and from the initial (and non-antepenultimate) syllable in *gene'rative* and *inte'resting*. The 'power' of penultimate stress is confirmed by the fact that it affects even those words which conform to a preferred antepenultimate stress pattern. Compare for example *poli'ticus* for *po'liticus* (cf. (8c)). All this does not mean, however, that no limits can be found to the range of penultimate stress. Only a quick glance at the examples in 2.1 reveals that in some contexts the shift to the penultimate hardly ever occurs, while in other contexts this shift occurs quite frequently. The former is the case when the final syllable consists of a tense vowel followed by at least one consonant, since these words conform to a preferred final syllable stress pattern (cf. 4.2.2.3 and 5.2). On the other hand, however, the fact that some word-final vowels (e.g. *i*, *o*, *a*) are closely related to penultimate stress – as we have seen in 4.1 and 4.2.2.1



this does not hold for all vowels!— is confirmed by the large number of stress shifts in this class of words. Compare in connection with this, the instances of penultimate stress in words ending in *a* (cf. 4.1 and 4.2.2.1): *An'kara*, *Ban'dirma*, *Bo'gota*, *Can'berra*, *Nia'gara*, *pa'gina*, etc.

#### 5.4 *MS shifts to the initial syllable*

##### 5.4.1 *In trisyllabic words*

Let us first discuss words consisting of more than two syllables. The data in (12e/f) and (13a/b) indicate that (i) irrespective of whether a word ends in a vowel or a consonant, MS can shift to the first syllable, and (ii) both in words that were originally stressed on their penultimate (12e, 13b), and in words that bore MS word-finally (12f, 13a), MS can shift to the first syllable of the word.

Although the data at my disposal are scanty, it seems justified to examine the characteristics of words in which MS shifts to the first syllable. (i) As for words ending in a consonant (12f, 13b), it should be noted that the final syllable of many of them contains a lax vowel (particularly [ɪ, ɛ, ɔ, ʌ], whereas the word-final consonant is often [+sonorant]. (ii) A distinguishing feature of nearly all the words in (12f) is the fact that, also in their 'original' word-final stress contour, the penultimate syllable consists of a shwa or a vowel that is normally strongly reduced.<sup>23</sup> (iii) Finally, the words in (13a) all end in *i* or *u*. The shift from the final to the initial syllable can be regarded as an indication of the fact that these vowels form part of the class of vowels which, when in word-final position, preferably do not bear MS.<sup>24</sup>

Finally a short remark concerning the potential overlap between the 'stress-initial' pattern and antepenultimate stress is in order. As was pointed out in 4.3.1 and 4.3.2, a shift to the first syllable in a trisyllabic word may only be related to antepenultimate stress if the word at issue conforms to a preferred antepenultimate stress pattern. Judging from the information contained in Blancquaert (1969: 173) (cf. 4.2.3), for the overwhelming majority of the words in (12e/f) and (13a/b) such an overlap between the 'stress-initial' pattern and antepenultimate stress seems improbable. Yet, as will be pointed out in 5.5, in this case, too, further research may reveal regularities which thus far have gone largely unnoticed.<sup>25</sup>

##### 5.4.2 *In bisyllabic words*

Some characteristic properties of the shift of MS to the initial syllable in bisyllabic words can easily be determined. Only a cursory investigation of

the bisyllabic words in (12a-d) makes clear that this shift is particularly popular in the following cases: (i) in words ending in *ks* (cf. 12b); (ii) in words ending in *i*, *o*, and *a* (cf. (12d)), and (iii) in consonant-final words the second syllable of which contains a lax vowel, whereas the word-final consonant is often [+sonorant] (cf. 12a/c).

Let me discuss these contexts in somewhat greater detail. As was pointed out in 4.3.1 and 4.3.2, in bisyllabic words that are stressed word-initially the 'stress-initial' pattern may overlap with penultimate stress. A clear illustration of this overlap is provided by the bisyllabic words ending in *i*, *o*, and *a*. From the foregoing it will be clear that some vowels are intimately related to the preferred penultimate stress pattern (cf. 4.1, 4.2.2.1, and 5.3). In 5.3 it was indicated that this preferred penultimate stress pattern for words ending in a vowel underlies many of the shifts to the penultimate in tri- and polysyllabic words, and from 2.1 it can be deduced that this shift is particularly popular in words ending in *i*, *o*, and *a*. The bisyllabic words display exactly the same picture. The shift of MS to the initial syllable in bisyllabic words, which in this case coincides with the penultimate, figures in the same environment, i.e. the preferred penultimate stress pattern that can be observed here, is clearly independent of the number of syllables in the word (cf. 4.3.1).

The bisyllabic words ending in *ks* have already been discussed in 4.2.2.2 and 4.3.1. In the latter section it was argued that the shift to the first syllable of the word does not overlap with penultimate stress, since trisyllabic words ending in *ks* are hardly ever stressed on their penultimate. Importantly, the only trisyllabic word ending in *ks* in which a stress shift occurs does not adopt penultimate stress, but MS is shifted to the initial syllable. Compare: '*paradox* for *para'dox* (12f).

Finally, these consonant-final bisyllabic words the second syllable of which contains a lax vowel, and the word-final consonant of which is often [+sonorant], are in need of discussion. Crucial, here, is the question whether the shift of MS to the initial syllable overlaps with penultimate stress or not. Although I do not wish to suggest that in this respect all lax vowels display the same behaviour, I am inclined to believe that for a number of lax vowels such an overlap can be denied.<sup>26</sup> It is clear that the context within which this shift to the first syllable of the word is operative largely resembles the context where the shift to the first syllable in trisyllabic words is in force (cf. 5.4.1). That is to say, both in bi- and trisyllabic words MS shifts to the *initial* syllable of the word. As a result, a preference of penultimate stress cannot be perceived in this class of trisyllabic words.

For a number of cases the absence of such a preferred penultimate stress pattern is clearly confirmed by the synchronic facts of Modern Dutch. Compare for example the trisyllabic words ending in *on*. Both word-initial and word-final stress are often found; penultimate stress, however, is quite rare. Examples: *'Helicon*, *'horizon*, *'lexicon*, *'marathon*, *'Oberon*, *'Pantheon*, *'Pentagon*, *'stadion*, etc.; *accordeo'on*, *basti'on*, *bombar'don*, *eska'dron* 'squadron', *kamele'on* 'chameleon', *lampi'on* 'Chinese lantern', *muske'ton* 'snap', *postil'jon* 'postillion', etc.; *A'äron*, *proto'zoön* 'protozoon', *rodo'dendron* 'rhododendron'.

This implies that, unlike bisyllabic words ending in *i*, *o*, and *a*, for the class of bisyllabic words at issue such an overall overlap between penultimate stress and the 'stress-initial' pattern cannot be assumed.

### 5.5 Concluding remarks

The general picture resulting from the discussion above is the following:

- (i) Shifts of MS to the final syllable are relatively rare, and if they occur, the 'new' position of MS is usually in conformity with the preferred final syllable stress patterns.
- (ii) Shifts to the penultimate are far more common, especially in words ending in a vowel, and in words the final syllable of which contains a shwa or an unstressed [ʌ] which may be followed by a consonant.<sup>27</sup> A second characteristic of penultimate stress (which, of course, is related to its popularity) is that it seems to develop into the general pattern of 'exotic' words. Compare in connection with this the Javanese and Turkish words which were stressed on their penultimate, irrespective of whether they end in a consonant or in a vowel (cf. 2.1).
- (iii) As far as the shift to the initial syllable does not overlap with penultimate stress, it is particularly popular in words whose final syllable contains a lax vowel followed by a (mostly [+sonorant]) consonant. Perhaps this pattern can best be regarded as the 'nativization' of foreign material.

I would like to conclude this section with a short note on the latter shift. As was mentioned before, certain types of trisyllabic words are stressed word-initially or word-finally, but hardly ever on their penultimate. Examples are formed by the words ending in *on* which were discussed in 5.4.2, and the words ending in *ks* in 4.3.1. Although I have only a restricted set of data at my disposal, certain indications can be found favoring the hypothesis that word-initial stress is the 'preferred stress pattern'

for these words. Firstly, some of these words display a stress shift to the initial syllable (cf. 5.4.1). Secondly, recently coined trade-marks are generally stressed word-initially (cf. 4.3.1). I doubt, however, whether these endings should simply be related to a preferred *initial* syllable stress pattern. (Note that, in the preceding, preferred stress patterns are only proposed within the domain of the 'stress-final' pattern.)

First of all polysyllabic words ending in *on* are *not* stressed on their initial syllable but on their antepenultimate. Compare: *a'crostichon*, *a'syndeton*, *e'pitheton*, *he'xameron*, *Na'poleon*, *sym'posion*, etc. Secondly, and perhaps more importantly, 'artificial' polysyllabic trade-marks ending in *ks* are always stressed on their antepenultimate, never on their initial syllable. Compare: *a'benolax*, *bo'nalkolax*, *kar'tofilex*, *san'tanolix*, etc.<sup>28, 29</sup>

If these facts are correct, this seems to indicate that antepenultimate stress, which, of course, in initially stressed trisyllabic words overlaps with the 'stress-initial' pattern, is a factor of far greater importance in the stress phenomena of Dutch simplex words than the traditional view wants us to believe.

## 6. Conclusion

The purpose of this paper was to show that the 'two pattern' approach for the stress contours of Dutch simplex words outlined above is preferable to analyses in which only one basic pattern is assumed. Moreover, I hope to have indicated that within the framework of this – admittedly 'taxonomic' – approach a more accurate account can be given of the diverse and intermingling factors involved.

## Notes

<sup>1</sup> In Van Lessen Kloeke (1973: 227) more data are presented than given here. These examples have been left out of consideration since in my opinion other factors, notably the influence of *written* language, have been operative here.

<sup>2</sup> Some of the German examples have been omitted as a consequence of their obviously *structured* nature, and the interference with the Dutch stress rules for complex words in which this would result (cf. Van Lessen Kloeke 1973: 228).

The rendering of '*spiritual* as *spi'ritual* (Van Lessen Kloeke 1973: 228) has been left out of consideration, since to my mind the 'incorrect' stress contour of *spi'ritual* should be looked upon as an overgeneralization of the *English* rule that words ending in *ual* are often stressed on their penultimate, cf. *indi'vidual*, *re'sidual*, etc.

<sup>3</sup> Similar data are presented by Ern  (1949: 142), who discusses the pronunciation of Javanese place-names by native speakers of Dutch. For unstructured words his conclusions can be summarized as follows: (i) bisyllabic words (save those whose first syllable contains a shwa) are stressed on their initial syllable, and (ii) trisyllabic words are normally stressed on their penultimate. If this syllable, however, contains a 'weak' vowel, MS is located on the first syllable. Compare respectively: '*Glatik*, '*Toetoer*, and '*Waroe*; *Ar'djoeno*, *Ka'dangan*, and *We'irang*; '*Magetan* and '*Polehan*.

According to Ern , polysyllabic words are interpreted as *structured* units, and MS is located on the first syllable of the second constituent. Note, however, that it is possible to predict the stress contour of these words without making an appeal to their assumed complex nature. In all these words MS is located on the penultimate, and in this way they display a striking correspondence with the Turkish examples in (9). Examples: '*Pakis'djadjar*, '*K bo'nagoeng*, '*Sekar'poero*, and '*Wono'sari*. (Notably rhythmic factors will be involved in the placement of so-called 'secondary stress' (cf. De Groot 1968: 217), which in the examples above is located on the initial syllable.

<sup>4</sup> All the Turkish examples in (9) were spontaneously pronounced by native speakers of Dutch, i.e. none of this material was obtained by asking an informant to pronounce a certain word. These data were collected by myself during several visits to Turkey.

<sup>5</sup> Words which possibly – their simplex nature is not quite beyond doubt – join the examples in (10c) are those which end in *meter*: '*diameter*, '*kilometer*, '*thermometer*, etc. (cf. Blancquaert 1969: 173-174).

Another group of words – whose simplex nature in my opinion cannot be doubted – in which the stress-initial stress contour figures is constituted by grammatical terms ending in *ief* (cf. Gaarenstroom 1897: 77; Paardekooper 1950: 259; Blancquaert 1969: 174). Examples: '*accusatief*, '*indicatief*, '*infinitief*, '*nominatief*, etc.

A third group of words, finally, which may display a word-initial stress contour is formed by words which have lost their internal structure and should therefore be regarded as simplex words in a synchronic analysis of present-day Dutch. An interesting example might be the word '*mali nkolder* 'hauberk' – note that it consists of no less than five syllables! – which, due to the fact that both *malie* and *kolder* have become nearly non-existent, is looked upon as an unstructured unit by many speakers of Modern Dutch.

<sup>6</sup> The overwhelming majority of these data were collected in the period extending from October 1977 to July 1978. No examples were obtained by asking informants to pronounce a certain word, i.e. all these data are from the spontaneous speech of native speakers of Dutch.

<sup>7</sup> As far as I am aware, the 'normal' pronunciation of '*Paraguay* and '*Uruguay* is with MS on the first syllable. The original stress pattern of these words, which is still recorded in the dictionaries, is with MS on the final syllable. Perhaps – and in combination with other factors – Paardekooper's 'opposition accent' has been in force here, too (cf. Paardekooper 1950).

<sup>8</sup> As a consequence of the emendation of the original main stress rule (cf. rule (2)), the 'new' stress pattern of the words in (12d) is predicted by Booij's main stress rule (cf. rule (1)).

<sup>9</sup> I am aware, of course, of the fact that the notion 'syllable' presents a number of difficulties. On the whole, however, these problems do not influence the determination of the *number* of syllables in a word. For the analysis presented below only this aspect of syllabification is relevant.

<sup>10</sup> The formalism used in this paper to express the regularities in the stress patterns of Dutch simplex words is an adaptation of that used by Kahn (1976).

<sup>11</sup> This pattern is based in the following rule, presented in Walker (1975: 887).

$$V \rightarrow [+ \text{stress}] / \text{--- } C_O (\partial C_O) \#$$

<sup>12</sup> According to Booij, the feature specification of the final vowel in the maximum expansion of this rule is necessary for the correct derivation of words such as *exer'citie* 'drill' and *o'pinie* 'opinion' (from Latin *exercitio* and *opinio*), which display 'penultimate' stress.

<sup>13</sup> According to Blancquaert (1969: 172-173), this holds for other endings as well, cf. *a'lumnus*, *pro'spectus*; *ana'thema*, *axi'oma*; *co'mmando*, *tor'pedo*; etc.

<sup>14</sup> Note that until now this preferred initial stress pattern – in bisyllabic words ending in *ks* it is the initial syllable which preferably bears MS – can be related to both penultimate stress and to the 'stress-initial' pattern. In section 4.3.1 I will return to this subject.

<sup>15</sup> Differences in the pronunciation of the vowel in the initial syllable have been left out of consideration.

<sup>16</sup> The fact that besides the 'original' *'samovar*, the form *'samovaar* (with tense [a] exists, seems to indicate that the tensing of the vowel in the final syllable has preceded the shift of MS (*samo'vaar*). This by no means implies, however, that in my opinion tensing always precedes the shift of MS. I used the term 'interdependence' purposely for the relation between final syllable stress and the nature of the vowel in the final syllable.

<sup>17</sup> Monosyllables can, of course, be related to final syllable stress, and to the 'stress-initial' pattern as well. The relation with the 'stress-final' pattern, however, seems questionable, for the distinguishing features of this pattern are the following: (i) the position of MS is defined with respect to the end of the word, and (ii) the factors which specify the 'regular' occurrence of final syllable, penultimate, and antepenultimate stress – i.e. the preferred 'stress-final' patterns – have a bearing on the segmental structure of the relevant syllables. It is this second property of the 'stress-final' pattern from which the monosyllables deviate. For, final syllable stress would have to imply unhampered, i.e. irrespective of the segmental structure.

<sup>18</sup> In the rendering of *inter'view* with word-final stress, this word ends in a 'clearly discernible off-glide.

<sup>19</sup> Anyway a clear exception to the traditional view exists, i.e. *'napalm*. Interestingly, it is not necessary to make an appeal to the preferred final syllable stress pattern to explain the rendering of *'Stockholm* as *Stock'holm*. The correct pronunciation of the nearly identical geographical name *Born'holm* is with word-final stress. Native speakers of Dutch, however, are apt to stress this word-initially (cf. (12c)). Overgeneralization of the word-final stress-contour as it figures in *Born'holm* leads to the hypercorrect rendering of *'Stockholm* as *Stock'holm*. Other instances of hypercorrection can be found below.

<sup>20</sup> This is confirmed by the fact that in 'intentional usage' some words are stressed on their penultimate to obtain a 'funny' effect. Well-known are the 'penultimate pronunciations' of *ca'lorie* (for *calo'rie*) 'calorie' and *epi'demie* (for *epide'mie*) 'epidemic'. Another example is *vokabu'larie*, the Dutchified form of English *vocabulary*, which is in use among schoolboys.

<sup>21</sup> Another example of hypercorrection in words ending in *i* is the rendering of *a pri'ori* (with MS on the penultimate) as *a 'priori*. Note that this is the only example in which MS shifts to the antepenultimate and non-initial syllable. Moreover, judging from Blancquaert (1969: 173), there is no question of a preferred antepenultimate stress pattern in this case.

<sup>22</sup> In Blancquaert (1969) this vowel is considered to be [ʌ] without exception.

<sup>23</sup> Possibly this property is important vis-à-vis the fact that in these words MS never shifts to the penultimate.

<sup>24</sup> Indications of the fact that word-final *i* is related to penultimate stress are discussed in 4.2.2.1 and 5.2; the behaviour of word-final *u*, on the other hand, has not been discussed, and awaits further research.

<sup>25</sup> The word '*vagina*' can be related to the preferred antepenultimate stress pattern, cf. Blancoquart (1969: 173), and 4.2.3. This word is normally pronounced with MS on the first syllable, whereas the original Latin stress contour is *va'gina*.

<sup>26</sup> A case for which this overlap cannot be denied is constituted by words ending in *or*. The bisyllables are stressed word-initially, and the tri- and polysyllables on their penultimate. Examples: '*motor*', '*rector*', '*rotor*', '*tumor*'; *con'vector*, *cu'rator* 'guardian', *dic'tator*, *re'flector*; *ele'vator*, *indi'cator*, *navi'gator*. From this it follows that the bisyllables can not only be related to the 'stress-initial' pattern but also to penultimate stress, since the preferred penultimate stress pattern that is in force here is independent of the number of syllables which make up the word (cf. 4.3.1).

<sup>27</sup> The popularity of penultimate stress in words whose final syllable contains a shwa expresses itself in quite another way, too. In some words which originally bore MS on their final syllable, the shift of MS to the initial syllable seems to operate unhindered, particularly in the uninflected forms. As a consequence of the attachment of certain inflectional suffixes, inflected forms may end in a syllable which contains a shwa. In this way they conform to a very 'strong' preferred penultimate stress pattern, and delay the change at issue. In colloquial Dutch the word '*marsepein*' 'marchpane' is usually stressed word-initially and the 'original' word-final stress contour (*marse'pein*) seems to be uncommon. In the inflected form, however, both the word-initial and the penultimate stress contour occur, cf. '*marsepeinen*' and *marse'peinen*. The same phenomenon can be observed in the word '*narcis*' 'daffodil'. In the singular the word-initial stress contour represents the most common pronunciation (although final syllable stress is not unheard of); both word-initial and penultimate stress, on the other hand, can be found in the plural, cf. '*narcissen*' and *nar'cissen*. (I am indebted to Annebel Venmans for drawing my attention to these forms.)

<sup>28</sup> I was not able to investigate the stress patterns of these nonsense words thoroughly. Interestingly, judging from the information which I elicited from my informants, the position of MS in these words shows hardly any variation.

<sup>29</sup> The grammatical terms ending in *ief* display such a firm relation with the 'stress-initial' pattern. That is to say, irrespective of the number of syllables they are stressed word-initially. Compare: '*accusatief*', '*datief*', '*genitief*' (cf. note 5).

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## ON VOWEL REDUCTION IN DUTCH

STANISLAW PRĘDOTA

### 1. Introduction

The fact that accent in Germanic words was fixed on the stem syllable had far-reaching consequences for the non-accented syllables in Germanic languages. The dynamic emphasis by means of main stress led to a gradual reduction of the syllables without main stress.<sup>1</sup> This reduction process, which has remained active to this day, shows different stages of development in the various Germanic languages. In this respect, Dutch has a position approximately in between English and German. In English the non-accented syllables have by and large disappeared, e.g. *to make*, *street*, etc., while they are often still present in German, and are pronounced like a short [ɔ], e.g. *machen*, *Straße*, etc. Dutch, on the other hand, has besides words where syllables without main stress have been eliminated, e.g. *straat*, words with unstressed short [ɔ], e.g. *maken*.

Dutch linguistics has been predominantly occupied with diachronic vowel reduction (Van Bree, 1977: 118ff.; Van Loey, 1970: 111ff.; id., 1976: 82ff.). Only recently has synchronic vowel reduction gained attention (Martin, 1968: 162-81; Brink, 1970: 151ff.; Stroop, 1974, 314-40; De Schutter, 1975: 173-202; Van Bakel, 1976: 46ff.; Booij, 1976: 461-9; id., 1977: 108ff.; Prędota, 1977: 155-75).

This paper describes the Germanic persistence towards reduction of unstressed syllables in Dutch from both points of view. In order to illustrate it, we will in a predominantly data-oriented approach discuss some of the remnants of the diachronic process by which, often through intermediate stages, partly reduced or shorter words have in time replaced fuller or longer ones to the detriment of their unstressed syllables, while it will be shown that synchronically the same tendency manifests itself in both native and foreign words, where both fuller or longer vs. reduced or shorter variants of basically the same word exist next to one another. We shall confine ourselves, as far as the distinction can be made at all, to those cases of reduction orthophonically accepted in the language.<sup>2</sup>

The organisation of the discussion is as follows. In section 2 we will discuss reduction phenomena in the native (Germanic) stock of Dutch words, both mono- and polymorphematic. The former are discussed in the order of their number of syllables. In section 3 we will be concerned with the foreign words, from various sources. It will be shown that these appear to have adjusted themselves with remarkable willingness to the native pattern of vowel reduction. In section 4 some general conclusions follow.

## 2. Vowel reduction in native words

### 2.1 Vowel reduction in monomorphematic words

#### 2.1.1 Vowel reduction in monosyllabic words

According to the quality of the vowel, Dutch monosyllabic words can be subdivided into three groups:

- (i) monosyllabic words with a tense vowel or diphthong, e.g. *goed* [ɣut] 'good', *baan* [ba.n] 'job', *oud* [aut] 'old';
- (ii) monosyllabic words with a lax vowel, e.g. *kind* [kɪnt] 'child', *zes* [zɛs] 'six', *van* [vɑn] 'of';
- (iii) monosyllabic words with stressless schwa [ə], e.g. *de* [də] 'the', *je* [jə] 'you', 't [ət] 'the' (neuter).

Some of the monosyllabic words of the first two types can undergo vowel reduction to stressless short [ə]. This phenomenon only pertains to unstressed proclitics and enclitics. This type of vowel reduction thus gives rise to doublets which are stylistically almost neutral, and have a complementary distribution vis-à-vis accent within the sentence. Unreduced variants occur under strong stress; reduced variants, on the other hand, occur under weak or no stress. Reduction of vowels and diphthongs to stressless short [ə] occurs for instance in the following examples:

[a:] > [ə]	:	<i>daar</i>	>	{	<i>d'r</i>	'there'
		<i>haar</i>	>	{	<i>'r</i>	'her'
[ɛi] > [ə]	:	<i>gij</i>	>	<i>ge</i>	'thou'	
		<i>jij</i>	>	<i>je</i>	'you' (sg.)	
		<i>wij</i>	>	<i>we</i>	'we'	
		<i>mijn</i>	>	<i>m'n</i>	'my'	
		<i>zijn</i>	>	<i>z'n</i>	'his'	
[au] > [ə]	:	<i>jou</i>	>	<i>je</i>	'(to) you/your' (sg.)	
		<i>jouw</i>	>			

[I] > [ɔ]	:	<i>ik</i>	>	'k	'I'
		<i>is</i>	>	's	'is'
[ɛ] > [ɔ]	:	<i>er</i>	>	'r	'there'
		<i>hem</i>	>	'm	'him'
		<i>ten</i>	>	t'n	'at'
		<i>ter</i>	>	t'r	'at'

All reductions mentioned predominantly occur in spoken Dutch, where they are considered quite acceptable by native speakers.

### 2.1.2 Vowel reduction in bisyllabic words

According to the quality of the vowel, bisyllabic words can be divided into two groups:

- (i) bisyllabic words with a full vowel or a diphthong in the primary stressed syllable, and a stressless short [ɔ] in the unstressed syllable, e.g. *kade* [ká.də] 'quay', *lente* [léntə] 'Spring', *zuiver* [zúeyver] 'pure';
- (ii) bisyllabic words with a full vowel or diphthong both in the syllable with and the one without main stress, e.g. *schaduw* [sxá.dyw] 'shadow', *arbeid* [órbeit] 'labour';

The majority of native bisyllabic words belong to subgroup (i), e.g. *ijzer* [éizər] 'iron', *heuvel* [hə.vəl] 'hill', *belang* [bəláŋ] 'importance', *gezag* [ɣəzáx] 'authority'. Historically, the reduction vowel [ɔ] in the unstressed syllables of these words is the result of a process dating back as far as from before the Middle Dutch period, that is from before the 12th century.<sup>3</sup> Synchronically, the following three types of reduction can be distinguished in subgroup (i):

- (a) [ɔ]-apocope;
- (b) [dɔ]-contraction of two types: in posttonic inlaut, and in unstressed auslaut;
- (c) [ɣɔ]-elision

These reduction processes give rise to doublets which are mostly stylistically different. Some illustrations of this are the following:

- (a) apocope of [ɔ] in auslaut position immediately to the right of main stress.

This reduction entails a series of words, such as:

- |     |               |            |               |        |
|-----|---------------|------------|---------------|--------|
| (1) | <i>dregge</i> | 'grapnel'  | <i>sprake</i> | 'talk' |
|     | <i>ebbe</i>   | 'low tide' | <i>stonde</i> | 'hour' |

<i>einde</i>	'end'	<i>verre</i>	'distant'
<i>Here</i>	'Lord'	<i>voorde</i>	'ford'
<i>ribbe</i>	'rib'	<i>vreze</i>	'fear'
<i>snebbe</i>	'beak'	<i>webbe</i>	'web'
<i>spanne</i>	'span'	<i>wonde</i>	'wound'

These words are found in two forms: a longer bisyllabic form without, and a shorter monosyllabic form with apocope of [ɔ], e.g. *dregge/dreg*, *ebbe/eb*, *einde/eind*, etc. There is a stylistic difference between the doublets. By and large, the longer form is used in formal, especially written language, where it is considered poetic and/or archaic. Moreover, these forms occur in fixed expressions, e.g.:

- |     |  |                  |
|-----|--|------------------|
| (2) | <i>ik ben de Here</i>                  | 'I am the Lord'  |
|     | <i>in angst en vreze</i>               | 'in great fear'  |
|     | <i>een pleister op de wonde leggen</i> | 'to compensate'  |
|     | <i>een spanne aarde</i>                | 'a span of soil' |
|     | <i>ter sprake brengen</i>              | 'to broach'      |

and in compounds such as

- |     |                       |                          |
|-----|-----------------------|--------------------------|
| (3) | <i>achterebbe</i>     | 'last stage of low tide' |
|     | <i>kerstkribbe</i>    | 'Christmas manger'       |
|     | <i>snijsponde</i>     | 'incised wound'          |
|     | <i>tijdspanne</i>     | 'span of time'           |
|     | <i>wordingsstonde</i> | 'hour of birth'          |

etc. The shorter forms, on the other hand, are considered stylistically neutral, and are preferred in everyday, informal use.

In some cases there is a difference in meaning between the form with and that without apocope of schwa, e.g.:

- |     |               |          |     |               |          |
|-----|---------------|----------|-----|---------------|----------|
| (4) | <i>sprake</i> | 'talk'   | vs. | <i>spraak</i> | 'speech' |
|     | <i>wijze</i>  | 'manner' | vs. | <i>wijs</i>   | 'tune'   |
|     | <i>ribbe</i>  | 'edge'   | vs. | <i>rib</i>    | 'rib'    |
|     | <i>groeve</i> | 'quarry' | vs. | <i>groef</i>  | 'groove' |

A final observation worth pointing out is that not all words with [ɔ] in auslaut can be reduced, e.g. *boete* 'fine' (noun), *kunde* 'knowledge', *kunne* 'sex', *lente* 'Spring', *rogge* 'rye', *tarwe* 'wheat' always maintain schwa.

- (b) [dɔ]-contraction, both in posttonic inlaut, and in unstressed auslaut.

[də]-contraction in posttonic inlaut concerns a number of words, such as:

(5)	<i>boedel</i>	'movables'	<i>veder</i>	'feather'
	<i>broeder</i>	'brother'	<i>vadem</i>	'fathom'
	<i>leder</i>	'leather'	<i>voeder</i>	'fodder'
	<i>ledig</i>	'empty'	<i>weder</i>	'weather'
	<i>neder</i>	'down'		

These words also have two forms: a longer bisyllabic form, and a shorter monosyllabic one with contracted [də], e.g. *boedel/boel*, *broeder/broer*, *leder/leer*, etc. These doublets differ stylistically. The longer forms are considered archaic, and occur mostly in the written language (cf. Kruijsingha, 1951: 167ff.; Zwaardemaker and Eijkman, 1928: 167ff.). Moreover, they occur in fixed expressions such as:

(6)	<i>een zwakke broeder</i>	'a weak person'
	<i>ter neder werpen</i>	'to cast down'
	<i>vogels van allerlei veder</i>	'birds of all feathers'

and in compounds:

(7)	<i>broedertwist</i>	'quarrel between brothers'
	<i>nederlaag</i>	'defeat'
	<i>vedertooi</i>	'decoration of feathers'
	<i>voedermiddel</i>	'fodder'
	<i>wederkeer</i>	'return' etc.

By and large, the shorter form is stylistically neutral and it is the preferred form in the spoken language.

In some cases the forms with [də] differ in meaning from those without, e.g.:

(8)	<i>broeder</i>	'friar'	vs.	<i>broer</i>	'brother'
	<i>ijdel</i>	'vain'	vs.	<i>ijl</i>	'thin'
	<i>ledig</i>	'lazy'	vs.	<i>leeg</i>	'empty'
	<i>moeder</i>	'mother'	vs.	<i>moer</i>	'nut, female screw'
	<i>teder</i>	'tender'	vs.	<i>teer</i>	'fragile'

It is important to note that [də]-contraction is impossible in some words, e.g. *adem* 'breath', *ader* 'vein', *ieder* 'each', *loeder* 'skunk', *poedel* 'poodle'.

[də]-contraction in unstressed auslaut has precisely the same characteristics. It affects words such as:

(9)	<i>heide</i>	'heath'	<i>spade</i>	'spade'
	<i>koude</i>	'cold (noun)'	<i>stade</i>	'occasion'
	<i>lade</i>	'drawer'	<i>trede</i>	'step'
	<i>mede</i>	'with'	<i>vrede</i>	'peace'
	<i>moede</i>	'tired'	<i>wade</i>	'shroud'
	<i>slede</i>	'sleigh'	<i>weide</i>	'pasture'
	<i>snede</i>	'cut'	<i>zijde</i>	'silk'

Again these words have two forms, a longer bisyllabic one with unelided [də], and a shorter monosyllabic form without [də], e.g. *heide/hei*, *slede/slee*, *lade/la*, etc. The longer forms are used in official, mostly written language, and occur in fixed expressions, such as:

(10)	<i>roosje op de heide</i>	'heath-rose'
	<i>mede van de partij zijn</i>	'to be part of the crowd'
	<i>zijn schade inhalen</i>	'to make up for'
	<i>de spade bij iets steken</i>	'to discontinue'
	<i>iemands zwakke zijde</i>	'someone's weak side'

They are also found in compounds such as:

<i>heideland</i>	'moorland'	<i>schadevrij</i>	'free of indemnity'
<i>koudegolf</i>	'cold wave'	<i>sledehond</i>	'sleigh dog'
<i>ladenkast</i>	'chest of drawers'	<i>spadesteek</i>	'spade-ful'
<i>medemens</i>	'fellow man'	<i>weidelandschap</i>	'meadow lands'

The shorter forms are usually stylistically neutral and are preferred in spoken language.

[də]-contraction does not take place across word boundaries. In words such as *goed* + ə 'good', *oud* + ə 'old', [d] is replaced by [j] ([ɣujə]) or [w] ([əuwə]). For further details, the reader is referred to Van Haeringen (1963), and Zonneveld (1978).

(c) [ɣə]-elision comprises a handful of words, among which the verbs *gelijk(en)* 'to resemble', and *geluk(ken)* 'to succeed'. They occur in two forms: a long form with unelided [ɣə], and a short form without [ɣə]: *lijk(en)* and *luk(ken)*. The longer forms occur in official, mostly written language. The shorter forms are regarded as stylistically neutral, and are found predominantly in the spoken language.

Bisyllabic words of group (ii), i.e. words with a full vowel or diphthong both in the syllable with and that without main stress, are relatively rare. They can be subdivided into the following classes.

- (i) non-compound monomorphemic words, e.g. *arbeid* 'labour', *avond* 'evening', *bérrie* 'stretcher', *scháduw* 'shadow', *vijand* 'enemy', *zwáluw* 'swallow (noun)';
- (ii) concealed compounds, e.g. *éiland* 'island', *óorlog* 'war', *brúiloft* 'wedding', *hértog* 'duke', *júffrouw* 'miss', *lichaam* 'body', *máarschalk* 'marshall', *vénnoot* 'partner', *wálrus* 'morse';
- (iii) compounds changed or transformed through popular etymology, e.g. *schéurbuik* 'scurvy', *óudroest* 'junk', *dúkdalf* 'mooring-post', *schárbier* 'inferior beer';
- (iv) concealed derivations, e.g. *bálling* 'exile' (noun), *gélling* 'male hemp', *schriílings* 'straddled', *síeraad* 'ornament', *táling* 'fear', *tíjding* 'tiding', *vónnis* 'verdict';
- (v) alliterating reduplications ('Streckformen'), e.g. *bimbam* 'bell', *kinkklaar* 'obvious', *liflaf* 'frill', *mikmak* 'the lot', *rompslomp* 'fuss', *tiktak* 'clock', *wirwar* 'tangle', *zigzag* 'id.';
- (vi) onomatopoeic words, e.g. *kíevit* 'peewit', *kóekoek* 'cuckoo';
- (vii) children's talk, e.g. *mama*, *papa*, *oma* 'granny', *opa* 'grandad'.

In these groups, two types of reduction can be distinguished: reduction of a tense vowel to a corresponding lax vowel, and reduction of a full vowel to schwa. These reduction processes, which occur separately and concern full vowels in syllables without main stress, are optional. The former type, i.e. reduction of a tense vowel to a corresponding lax one, can be observed in only one case: [i] > [ɪ] in *kíeviet* > *kíevit*. The latter type, reduction of a full vowel to schwa, can be subdivided into the following cases:

[ɪ] > [ə] :

<i>hávik</i>	'hawk'	<i>míerik</i>	'horse-radish'
<i>hóning</i>	'honey'	<i>misschién</i>	'perhaps'
<i>kérmis</i>	'fair' (noun)	<i>pérzik</i>	'peach'
<i>kóning</i>	'king'	<i>zánik</i>	'nag' (noun)

[ɔ] > [ə] :

<i>ávond</i>	'evening'
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While reduction in these cases is optional and condition by style, there are also a number of cases of especially [a.] > [ə] which strike most native speakers as archaic, such as:

[a.] > [ɔ] :

<i>bogaard</i>	>	<i>bogerd</i>	'orchard'
<i>altaar</i>	>	<i>outer</i>	'shrine'
<i>mutsaard</i>	>	<i>mutserd</i>	'faggot'
<i>standaard</i>	>	<i>standerd</i>	'stand' (noun)

Historically, even more far-reaching reduction processes have applied to concealed compounds, producing synchronic doublets such as:

(11) <i>ambacht</i>	'trade'	vs.	<i>ambt</i>	'office'
<i>jonkheer</i>	'Squire'	vs.	<i>jonker</i>	'Squire'
<i>juffrouw</i>	'Miss'	vs.	<i>juffer</i>	'young lady'
<i>wijngaard</i>	'vineyard'	vs.	<i>wingerd</i>	'vine'

In most of these cases the relation between the doublets is only diachronic.

### 2.1.3 Vowel reduction in trisyllabic words

According to the quality of the vowels, trisyllabic words can be subdivided into three groups:

- (i) trisyllabic words with a stressed full vowel or a diphthong, plus two reduction vowels [ɔ] in the syllables without main stress, e.g. *gisteren* 'yesterday', *genade* 'mercy';
- (ii) trisyllabic words with two full vowels or diphthongs, one of which occurs in the syllable bearing main stress, and with a reduction vowel schwa, e.g. *armoede* 'poverty', *weduwe* 'widow'.

The majority of the native trisyllabic words belong to the former group. The reduction vowel [ɔ] in the unstressed syllables of these words is the result of a reduction process which started before the Middle Dutch period (see fn. 3). Within this group one finds the two reduction processes also encountered in the bisyllabic words: [dɔ]-contraction and [ɣɔ]-elision. The former can be observed in a case such as *héderik/hérik* 'charlock'. Furthermore, the verb *vergader(en)* has a contracted variant *vergar(en)* with a difference in meaning: 'to assemble' vs. 'to collect'. [ɣɔ]-elision produces the doublets *gestadig/stadig* 'steady'.

Trisyllabic words belonging to the second group, i.e. words with two full vowels or diphthongs one of which occurs in the syllable bearing main stress, and with a reduction vowel [ɔ], are quite rare. Again, these words can be subdivided into the following classes:

- (i) non-compound words, e.g. *kabouter* 'gnome', *léeuwerik* 'lark'.



*wéduwe* 'widow';

(ii) concealed compounds, e.g. *ássepoes* 'cinderella', *brúidegom* 'bridegroom', *dágeraad* 'dawn', *hórrelvoet* 'club-foot', *iezegrim* 'grumbler', *madelief* 'marigold', *náchtegaal* 'nightingale', *óoievaar* 'stork', *póllepel* 'ladle', *rágebol* 'ceiling-mop', *róbbedoes* 'romp', *úiterwaard* 'water meadow';

(iii) compounds changed through popular etymology, e.g. *hagedís* 'lizard', *hélleveeg* 'shrew', *scharminkel* 'scrag', *wielewaal* 'golden oriole', *wildebras* 'tomboy', *zénegroen* 'ajuga';

(iv) concealed derivations, e.g. *ármoede* 'poverty', *meewárig* 'compassionate', *oubóllig* 'corny', *vollédig* 'complete', *vrijpóstig* 'Impudent', *zwézerik* 'thymus';

(v) alliterating reduplications, e.g. *rikketik* 'heart'.

In the above groups the following reduction types can be distinguished:

- (a) alternation of a full vowel [I] and [ɔ]: *hederik*, *leeuwerik*, *zwezerik*;
- (b) [ɔ]-syncope: e.g. *ragebol* > *raagbol*, *karekiet* 'reed-warbler' > *karkiet*;
- (c) [ɔ]-apocope: e.g. *weduwe* > *weeuw* (including [de] contraction);
- (d) [dɔ]-contraction: e.g. *armoede* > *armoe*.

These reduction processes are optional and occur in spoken language.

#### 2.1.4 Vowel reduction in quadri-syllabic words

Quadri-syllabic monomorphemic words, which are very rare indeed, generally consist of two full vowels or diphthongs, and two schwas. They can be subdivided into the following classes:

- (i) concealed compounds: e.g. *hávezate* 'manorial farm';
- (ii) concealed contractions: *uientréuren* 'exhaustively', *uitermáte* 'extremely';
- (iii) concealed derivations: e.g. *wispeltúrig* 'fickle';
- (iv) reduplicating onomatopoeic words, e.g. *wíssewasje* 'trifle'.

Synchronically, no cases of Vowel Reduction can be motivated for native monomorphemic words of this length.

## 2.2 Vowel reduction in prefixes and suffixes

### 2.2.1 Vowel reduction in prefixes

According to the quality of the vowel, native prefixes can be subdivided into the following three groups:

- (i) pretonic prefixes with a reduction vowel [ə];
- (ii) pretonic prefixes with a full vowel;
- (iii) stressed prefixes with a full vowel.

In the prefixes of the first group, i.e. *be-*, *ge-*, *te-*, the process of reduction to schwa dates back as far as the transition from Old Dutch to Middle Dutch (Van Loey, 1970: 242ff.). These prefixes, when occurring before the liquids [l] and [r] in rapid pronunciation show [ə]-syncope, e.g. *believen* > *blieven* 'to like', *geloven* > *gloven* 'to believe', *terecht* > *trecht* 'justified', *terug* > *trug* 'back'.

In the prefixes of the second group, *er-*, *ver-* and *ont-*, one can observe the initial stages of a reduction process [ɛ] > [ə], e.g. *erbarmen* 'mercy', *erkennen* 'to recognize', *vergelijken* 'to compare', *vergemakkelijken* 'to facilitate', *vergenoegen* 'to satisfy', *vergewissen* 'to ascertain', *verpersoonlijken* 'to personalize'. In all these examples, however, reduction is as yet optional. In the prefix *er-* it is even considered un-orthophonic by many. No reduction is allowed in *ont-* as in *ontvangen* 'to receive', *ontkennen* 'to deny'.

To the third group belong the stressed prefixes *her-*, *on-*, *wan-*, and the derived prefixes *aarts-*, *in-*, and *oer-*. Prefixes of this group show no reduction whatsoever.

### 2.2.2 Vowel reduction in suffixes

According to the quality of their vowel, suffixes can be subdivided into the following three groups:

- (i) unstressed suffixes with a reduction vowel [ə];
- (ii) unstressed suffixes with a full vowel or a diphthong;
- (iii) stressed suffixes with a full vowel or a diphthong.

In the unstressed suffixes of the first group, i.e. *-e*, *-el*, *-en*, *-er*, *-erd*, *-ig*, *-je*, *-jes*, *-lijk*, *-lijks*, *-se*, *-sel*, *-ster*, *-te*, the reduction process to [ə] has been introduced in various periods of earlier Dutch (Van Loey, 1970: 197ff.). The preserved spelling of *-ig*, *-lijk*, and *-lijks*, is an indication of their original, unreduced pronunciation.

Unstressed suffixes belonging to the second group are: *-aar*, *-aard*, *-achtig*, *-baar*, *-dom*, *-heid*, *-igheid*, *-ik*, *-ing*, *-isch*, *-loos*, *-nis*, *-rijk*, *-schap*, *-zaam*. Within this group of suffixes (or combinations of them), one finds a type of optional reduction: reduction of a full vowel [ɪ] to [ə] can be observed in the following cases:

- (12) *-ik* : e.g. *bolderik* 'corn-cockle'  
                   *viezerik* 'dirty fellow'  
       *-ing* : e.g. *woning* 'dwelling'  
                   *koningin* 'queen'  
       *-nis* : e.g. *kennis* 'knowledge'  
                   *vuilnis* 'dirt'

In the stressed suffixes of the third group, such as *-es*, *-haftig*, *-ier*, *-in*, *-ij*, *-matig* (and their variants), no reduction can be observed.

### 3. Vowel reduction in loanwords

As a result of vowel reduction, both diachronic and synchronic, native words are generally structured as follows: a full vowel or a diphthong in the stressed syllable, plus a reduction vowel [ə] in the syllables that do not bear main stress. A great number of loanwords, particularly from the Romance languages, show a completely different structure. They contain full vowels in the syllables without main stress as well. In the course of their adaptation to Dutch, however, they were influenced by the same reduction processes responsible for the structure of native words. Other loanwords have adapted themselves complete to the borrowing language, such as:

- (13) Lat. *beryllus* > Du. *bril* 'spectacles'  
       Lat. *corona* > Du. *kroon* 'crown'  
       Lat. *correctus* > Du. *krek* 'exactly'  
       Fr. *carotte* > Du. *kroot* 'beetroot'  
       Fr. *couleur* > Du. *kleur* 'colour'  
       Fr. *Corinthe* > Du. *krent* 'current'  
       Fr. *perruque* > Du. *pruik* 'wig'

(cf. Van Loey, 1970: 112). Our attention shall be focused on the reduction processes presently occurring in loanwords.

Before considering these processes in more detail, it is important to note the connection between phonostylistic ranges of pronunciation and the phonic adaptation of the class of loanwords.<sup>4</sup> In careful, cultivated utterances, fewer vowel reductions occur than in everyday colloquial speech. This paper will only be concerned with the reductions which are considered permissible according to the standards set down by De Coninck.

Moreover, there is a certain relation between the ranges of pronunciation per country on the one hand, and vowel reduction in loanwords on the other (cf. Blancquaert, 1968: 164ff.; Hermkens, 1969: 67ff.). In the southern regions of the Dutch language area, which is the Belgian region exposed to direct influence from French, one can observe a greater tendency to retain the original, i.e. unreduced, pronunciation of words of Romance origin. On the other hand, in the North, where only very little of this influence is felt, one observes a tendency to prefer the reduced variants.

### 3.1 Reduction of tense vowels to corresponding lax vowels

Reduction of tense vowels to lax vowels pertains to the partial reductions [i] > [ɪ], [e.] > [ɛ], and [e.] > [ɪ]. These reductions occur in the unstressed syllables of some words of French origin:

- (i) [i] > [ɪ] :      *miníster*                      'minister'  
                               *penicillíne*                      'penicillin'  
                               *reminiscéntie*                      'memory'

In words such as *palissáde* 'palisade', *periscóop* 'periscope', *vernisságe* 'varnish', *syllábe* 'syllable', *systéem* 'system', in which ⟨i⟩ and ⟨y⟩ occur in closed syllables (both are [i]), vowel reduction is moreover supported by the interference of script. For in closed syllables in native words only [ɪ] occurs, e.g. *distel* 'thistle'.

- (ii) [e.] > [ɛ] in the prefix *des-*, as in:  
                  *desinféctie*                      'disinfection'  
                  *desintegrátie*                      'disintegration'  
                  *desorganisátie*                      'disorganization'  
                  *desoxydátie*                      'disoxydation'  
                  *destructíef*                      'destructive', etc.

Some words with [e.]'s in pretonic syllables allow reduction of the initial [e.] to [ɪ] (and the non-initial one(s) to [ə], see below for reduction of tense vowels to schwa). Some examples are:

- (iii) [e.] > [ɪ] :      *telegráaf*      [tɪləɣra.f]      'telegraph'  
                               *repetítie*      [rɪpətitsi]      'repetition'  
                               *televisie*                      'television'  
                               *telefonéren*                      'to call up'

## 3.2 Reduction of tense vowels to [ə]

This reduction process concerns tense vowels, which in unstressed syllables are reduced to [ə]. This type of reduction occurred in native words as early as the transitional period from Old to Middle Dutch, e.g. *ginatha* > *genade* 'mercy', *biginnan* > *beginnen* 'to begin', *namo* > *name* 'name', *ora* > *ore* 'ear'.

This reduction can be observed in unstressed syllables in a limited number of words of Romance origin:

[i] > [ə] :	<i>naïvitéit</i>	'naivety'	<i>medicijn</i>	'medicine'
	<i>regimént</i>	'regiment'	<i>relikwie</i>	'relic'
	<i>vigilánte</i>	'cab'	<i>vermicélli</i>	'vermicelli'
[y] > [ə] :	<i>pluvier</i>	'plover'	<i>notúlen</i>	'minutes'
	<i>populier</i>	'poplar'	<i>ursulíne</i>	'ursuline'
[e.] > [ə] :	in pretonic syllables in:			
	<i>reductie</i>	'reduction'	<i>operátie</i>	'operation'
	<i>telefoon</i>	'telephone'		
	in posttonic syllables in:			
	<i>ángelus</i>	'angelus'	<i>cámera</i>	'camera'
[u] > [ə] :	<i>kángoeroe</i>	'kangaroo'		
[o.] > [ə] :	<i>akoléi</i>	'columbine'	<i>sodomíeter</i>	'bugger'
	<i>comodóre</i>	'comodore'	<i>krokodíl</i>	'crocodile'
	<i>peloton</i>	'platoon'		

## 3.3 Reduction of lax vowels to [ə]

The type of reduction relevant here had been operative in native words in the transitional period from Old to Middle Dutch as well, e.g. *bergin* > *bergen* 'mountains', *bikennan* > *bekennen* 'to confess', *bewarun* > *bewaren* 'to keep', *gelicon* > *geliken* 'to resemble'.

This process can be observed in the unstressed syllables of a number of words of Romance or English origin:

[l] > [ə] :	in pretonic position e.g.:			
	<i>biljárt</i>	'billiard'	<i>miljóen</i>	'million'
	<i>miljárd</i>	'billion'	<i>paviljóen</i>	'pavillion'
	<i>postiljón</i>	'postilion'	<i>repórter</i>	'reported'

in posttonic position in e.g.:

	<i>básis</i>	'basis'	<i>diémit</i>	'dimity'
	<i>kanúnnik</i>	'canon'	<i>tálsman</i>	'talisman'
	<i>ténissen</i>	'to play tennis'	<i>sténcil</i>	'mimeograph'
[ɛ] > [ə] :	<i>directéur</i>	'manager'	<i>intelligént</i>	'intelligent'
	<i>intensief</i>	'intensive'	<i>protestánt</i>	'protestant'
	<i>regént</i>	'regent'		
[ɑ] > [ə] :	<i>kákatoe</i>	'cockatoo'	<i>kátapult</i>	'catapult'
[ɔ] > [ə] :	<i>dóctor</i>	'doctor'	<i>mótor</i>	'motor'
	<i>proféssor</i>	'professor'		

### 3.4 Syncope of full vowels

This reduction process concerns the full vowels [i, e, o, u, and a] which can undergo syncope in pretonic syllables. This process occurred at an earlier stage in older Romance borrowings, see *carotte* > *kroot* etc. above.

This type of syncope can be observed in the pretonic syllables of a limited number of Romance loanwords:

[i] :	<i>siroop</i>	> <i>stroop</i>	'sirup'
	<i>officier</i>	> <i>ofcier</i>	'officer'
[e.] :	<i>kanevas</i>	> <i>kanvas</i>	'canvas'
	<i>marechaussee</i>	> <i>maarchaussee</i>	'military police'
[o.] :	<i>koraal</i>	> <i>kraal</i>	'coral'
	<i>eau de c(o)logne</i>		'id.'
[u] :	<i>courant</i>	> <i>krant</i>	'newspaper'
[a.] :	<i>kalamink</i>	> <i>kalmink</i>	'calamanco'
	<i>kanaster</i>	> <i>knaster</i>	'canaster'
	<i>palei</i>	> <i>plei</i>	'pulley'
	<i>makaron</i>	> <i>makron</i>	'macaroon'
	<i>salade</i>	> <i>sla</i>	'lettuce'

### 3.5 [ə]-drop

[ə]-drop is related both to [ə]-apocope and -syncope. The process under consideration here started in native words in the transitional period from Middle to Modern Dutch, e.g. *tonge* > *tong* 'tongue', *oghe* > *oog* 'eye', *name* > *naam* 'name', *lovede* > *loofde* 'praised', *makede* > *maakte* 'made', *horede* > *hoorde* 'heard'. These processes can also be observed synchronic-

ally, see sections 2.1.2-4 above. Some examples of Romance loanwords are:

[ə]-apocope:

<i>klasse</i>	>	<i>klas</i>	'class'
<i>machine</i>	>	<i>machien</i>	'machine'

[ə]-syncope:

<i>rozemarijn</i>	>	<i>ròosmarijn</i>	'rosemary'
<i>heremiet</i>	>	<i>hermiet</i>	'hermit'
<i>referein</i>	>	<i>refrein</i>	'chorus'
<i>tafereel</i>	>	<i>tafreel</i>	'scene'

#### 4. Conclusions

In loanwords the same types of vowel reductions occur which are operative in native words. These processes are optional and mostly concern individual loanwords. An exception to this are the reduction processes [e.] > [ə] and [ɛ] > [ə], which occurred in roughly 30% and 20%, respectively, of the loanwords which fitted the structural description necessary for reduction.<sup>5</sup>

Vowel reductions in loanwords give rise to stylistic word variants. Reduced word forms, which as a rule are considered highly colloquial, or even substandard, mostly occur in spoken language. While the ortho-phonetic standard has partly succeeded in suppressing vowel reduction, it is incapable of preventing it completely.

#### Notes

<sup>1</sup> Cf. for instance Boer (1918), Meillet (1917).

<sup>2</sup> Cf. De Coninck (1970).

<sup>3</sup> Cf. Van Bree (1977: 199ff.).

<sup>4</sup> Cf. Booij (1976: 467ff.), Linthorst and Leerkamp (1969: 105ff.).

<sup>5</sup> Cf. Martin (1968: 165).

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# DUTCH DIMINUTIVES OVER EASY\*

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## *1. Introduction*

The aim of this article is twofold: In the first place, I would like to point out some of the problems left unsolved by Haverkamp-Lubbers and Kooij (H-L & K) in their 1971 phonological analysis of the Dutch diminutive, and indeed, as far as I know, left unsolved by any preceding or following treatments of the diminutive problem. In the course of the discussion, it should become clear that these solution-resistant anomalies are a result, not of faulty analysis on the part of the authors in question, but of the system which they use, namely that of standard generative phonology.

The second aim of the article, then, is to argue for an alternative method of phonological analysis, namely that first introduced in Leben and Robinson 1977, and further worked out in Robinson 1977b, Leben (1979), Robinson (1978c and 1978d), and known by the name of 'Upside-down' phonology. I will essentially be dealing here with two different but related areas of interest, that of rule ordering, and that of phonological change. I will attempt to show that the predictions made by 'Upside-down' phonology in these areas square quite well with the situation in Dutch diminutives, and allow for a satisfactory analysis of the problems previously unsolved or even ignored within a standard generative framework.

## *2. The data*

In Dutch, as in a number of other Germanic languages, there is a nominal suffix has essentially five separate allomorphs: *-tje*, *-etje*, *-je*, *-pje* and *-kje*.

\*For getting me interested in this topic, and for giving me most of the knowledge I have about the forms of the diminutive, special thanks are due to the *Werkgroep Algemene Taalwetenschap – Morfologie*, held at the Rijksuniversiteit te Leiden in the academic year 1970-71 under the leadership of Mariëtte Winkel.

ent, or, depending on the situation, a positive or negative evaluation on the part of a speaker with respect to the referent. In Standard Dutch that suffix has essentially five separate allomorphs: *-tje*, *-etje*, *-je*, *-pje* and *-kje*. Some illustrative examples from Cohen 1958 (given in standard orthography):

(1) <i>diminutive</i>	<i>positive</i>	<i>gloss</i>
stoeltje	stoel	chair
balletje	bal	ball
oogje	oog	eye
duimpje	duim	thumb
woninkje	woning	dwelling

2.1. As even this list already shows, the choice of diminutive allomorphs is basically determined by the phonological form of the positive. The environments for the various realizations may be characterized as follows (in general following Cohen 1958):

2.1.1. The allomorph *-tje* is found: a) after vowels, diphthongs and glides, cf. *koetje* [kučə] from *koe* [ku] 'cow'; *eitje* [eičə] from *ei* [ei] 'egg'; *leeuwkje* [lewčə] from *leeuw* [lew] 'lion'; b) after the sonorants *l*, *n*, and *r* if they are preceded by a tense vowel or diphthong, or by an unstressed lax vowel (usually [ə]): *beentje* [benčə] from *been* [ben] 'bone'; *stoeltje* [stulčə] from *stoel* [stul] 'chair'; *boertje* [burčə] from *boer* [bur] 'farmer'; *lepeltje* [lepəlčə] from *lepel* [lepəl] 'spoon'; *kikkertje* [kɪkərčə] from *kikker* [kɪkər] 'frog'; probably also *traktortje* [traktərčə] from *traktor* [traktər] 'tractor'.<sup>1</sup>

2.1.2. The allomorph *-etje* is found after the sonorants *m*, *n*, *ŋ*, *l*, and *r* when these are preceded by lax vowels with some degree of stress (whether primary, secondary or tertiary): *kammetje* [kaməčə] from *kam* [kam] 'comb'; *penmetje* [penəčə] from *pen* [pen] 'pen'; *ringetje* [rɪŋəčə] from *ring* [rɪŋ] 'ring'; *pilletje* [pɪləčə] from *pil* [pɪl] 'pill'; *sterretje* [stərəčə] from *ster* [stər] 'star'; *wandelinetje* [vándəlɪŋəčə] from *wandelɪŋ* [vándəlɪŋ] 'walk'; *leerlingetje* [lérlɪŋəčə] from *leerling* [lérlɪŋ] 'pupil'.<sup>2</sup>

2.1.3. *-je* is found after nonsonorant consonants: *geitje* [γeičə] from *geit* [γeit] 'goat'; *pakje* [pakje] from *pak* [pak] 'parcel'; *dasje* [dašə] from *das* [das] 'tie'; *lachje* [laxjə] from *lach* [lax] 'laugh'.

2.1.4. *-pje* is found after *m* preceded by a tense vowel or by an unstressed lax one: *bloempje* [blumpjə] from *bloem* [blum] 'flower'; *bodempje* [bodəmpjə] from *boedem* [bodəm] 'bottom'.

2.1.5. *-kje* is found after *η* preceded by an unstressed lax vowel: *koninkje* [kónɪŋkjə] from *koning* [kónɪŋ] 'king' (for historical reasons, tense vowels may not precede *η* in Dutch).

2.2. Besides the allomorphic variation found in the diminutive suffix itself, Dutch shows some allomorphic variation of the stem *before* the diminutive suffix. Most such instances will not interest us here, since their conditioning is clearly morphological, and the number of items varying in this way is heavily circumscribed. Specifically, a number of items ending in [də] in the positive show a lack thereof in the diminutive, cf. *chocolaatje* [ʃɔkolačə] from *chocolade* [ʃɔkoladə] 'chocolate'. In another group of items, the plural stem seems to have been the basis for the diminutive, cf. *glasjes* [ɣlaʃə] from *glas* [ɣlas] 'glass', with the same tense vowel found in the plural *glazen* [ɣlazə(n)]; also interesting is the diminutive singular/plural alternation *kindje* [kɪnčə] / *kindertjes* [kɪndərčəs] following the positive *kind* [kɪnt] 'child' / *kinderen* [kɪndərə(n)] 'children'. For discussion of these points, the reader should refer to H-L & K (cf. also Tiersma's article in this volume). I will not treat them in following sections.

### 3. The standard analysis

I present below the ordered set of generative rules suggested by H-L & K to account for the suffixal alternations summarized above. In doing so, I have eliminated a number of rules which do not directly bear on the problems discussed here. Some of these eliminated rules deal with the stem-alternations discussed in 2.2. Two others (their rules 2 and 11) essentially deal with the assignment of the underlying form /tj/ to the category DIM, and the later addition of a final [ə]; in this case I have simply assumed the existence of an underlying suffix /tjə/, the exact manner of its insertion being irrelevant to the present discussion. Others of their rules deal with changes common to both positive and diminutive forms, such as final devoicing, accent assignment and ə-epenthesis in words like *wandeling* 'walk'; I will assume the prior application of all such rules in the quasi-underlying forms given below. Finally, of their two different formulations of the ə-insertion rule which creates *-etje*, I have chosen the second, which

assumes a tertiary stress on the last syllables of *wandeling* 'walk' and *leerling* 'pupil'.

This last-mentioned rule is indeed the first which I will list, as follows:

$$(2) \quad \phi \rightarrow \partial \quad / \quad \left[ \begin{array}{c} V \\ -\text{tense} \\ +\text{stress} \end{array} \right] \quad \left[ \begin{array}{c} +\text{son} \\ +\text{cons} \end{array} \right] \quad \text{---} \quad tj$$

This has the effect of inserting a  $[\partial]$  before the diminutive suffix in underlying forms like  $/kam\#tj\partial/$  'little comb',  $/ster\#tj\partial/$  'little star',  $/pIl\#tj\partial/$  'little pill',  $/v\acute{a}nd\partial l\eta\#tj\partial/$  'little walk' and so on. It is important to note that none of the forms affected by this rule will undergo any of the following rules until rule (6) below, and specifically that rule (2) 'bleeds' rule (3) of representations to which the latter could theoretically apply.

$$(3) \quad \left[ \begin{array}{c} +\text{ant} \\ +\text{cor} \end{array} \right] \rightarrow \left[ \begin{array}{c} \alpha\text{ant} \\ \beta\text{cor} \end{array} \right] \quad / \quad \left[ \begin{array}{c} +\text{son} \\ -\text{voc} \\ +\text{cons} \\ \alpha\text{ant} \\ \beta\text{cor} \end{array} \right] \quad \left[ \begin{array}{c} +\text{cons} \\ -\text{voc} \\ -\text{strid} \\ \text{---} \end{array} \right]$$

This rule is responsible for the change in underlying forms like  $/blum\#tj\partial/$  'little flower' and  $/konI\eta\#tj\partial/$  'little king' to their ultimate pronunciations as  $[blumpj\partial]$  and  $[konI\eta kj\partial]$ . As formulated, of course, the rule is much too broad. It would, for example, change the  $t$  of  $(hij) komt$  '(he) comes' to  $(hij) komp$ , which, if found at all, is very substandard. Thus in order to make this rule work correctly, one must at least have a  $j$  in the right environment, and perhaps other modifications as well.

$$(4) \quad t \rightarrow \phi \quad / \quad \left[ \begin{array}{c} -\text{son} \\ +\text{cons} \end{array} \right] \quad \text{---} \quad \left[ \begin{array}{c} +\text{son} \\ -\text{voc} \\ -\text{cons} \\ +\text{high} \end{array} \right] \quad (C_1) \#$$

Rule (3) is responsible for the change of forms like  $/\gamma\epsilon it\#tj\partial/$  'little goat' to intermediate  $/\gamma\epsilon itj\partial/$  (ultimately  $[\gamma\epsilon i\check{\partial}]$ ),  $/pak\#tj\partial/$  'little parcel' to  $[pakj\partial]$ ,  $/lax\#tj\partial/$  'little laugh' to  $[laxj\partial]$  etc. The right environment apparently contains an optional consonant to account for adverbs like *netjes* 'neatly', *slapjes* 'slackly' and so on. The vowel  $[\partial]$  is missing in the right environment due to H-L & K's decision to bring in that vowel later. As I stated earlier, this has no particular repercussions for our discussion.

It should be noted that the specification  $[-\text{son}]$  is in fact necessary in the left environment of this rule, since forms like *\*maanje* 'little moon'

for *maantje* are impossible. Thus one might think at first that rule (4) is not crucially ordered with respect to rules (2) or (3), the latter applying after sonorants, rule (4) after nonsonorants. Yet their ordering does make a difference: given an input of the form  $/amt\#tjə/$  'little office', an ordering of (4) before (2) will yield  $[aməčə]$ , (2) before (4)  $[amčə]$ , which latter appears to be the correct form. Further, given an input of the form  $/bemt\#tjə/$  'little meadow', ordering of (4) before (3) will yield  $[bempjə]$ , (3) before (4)  $[bemčə]$ , which appears to at least be the most common form (cf. H-L & K p. 11). Finally, the ordering of (2) before (4) appears to be absolutely necessary to prevent forms like  $/lant\#tjə/$  'little land' and  $/bort\#tjə/$  'little board' from becoming  $[lanəčə]$  and  $[borəčə]$  respectively, instead of the correct  $[lančə]$ ,  $[borčə]$ .

$$(5) \quad t \rightarrow \emptyset \quad / \quad \begin{bmatrix} -\text{son} \\ +\text{cons} \\ +\text{strid} \end{bmatrix} \text{ — } \begin{bmatrix} +\text{son} \\ -\text{cons} \\ -\text{voc} \\ +\text{high} \end{bmatrix} \quad \#$$

This rule accounts for the deletion of a stem-final *t* which is preceded by the strident fricatives *f*, *s*, *x*, as in  $/kast\#tjə/$  'little cupboard' (which after rule (4) appears as  $/kastjə/$ ) to  $/kasjə/$  (ultimately  $[kašə]$ ),  $/ɣraxt\#tjə/$  to  $[ɣraxjə]$ , etc. As formulated, this rule must clearly follow rule (4), since stem-final *t* will only appear before *j* after the suffix-initial *t* has been eliminated. Its *similarity* to rule (4), incidentally, cannot be denied. Indeed, for some speakers, who also delete stem-final *t* after *p* and *k* (cf. H-L & K p. 19) it is identical, except insofar as rule (5) is much more optional than rule (4). Thus for these speakers (saving optionality factors) (4) and (5) could be collapsed and seen as a single iterative rule.<sup>3</sup>

$$(6) \quad [+ant] \rightarrow [-ant] \quad / \quad \left( \begin{bmatrix} -\text{son} \\ +\text{cor} \end{bmatrix} \right) \begin{bmatrix} -\text{son} \\ +\text{cor} \end{bmatrix} \text{ — } \begin{bmatrix} +\text{son} \\ -\text{voc} \\ -\text{cons} \\ +\text{high} \end{bmatrix}$$

This rule is primarily intended to palatalize *t* and *s* before *j*, as for example in  $[dašə]$  'little tie' from  $/das\#tjə/$ ,  $[kačə]$  'little cat' from  $/kat\#tjə/$ , and all of the *-tje* and *-etje* forms cited above. It is also intended to allow for the (optional?) palatalization of any *n* or *t* preceding the *t* or *s* in question, as in  $[mañčə]$  'little basket' from  $/mant\#tjə/$ ,  $[fičšə]$  'little bike' from  $/fits\#tjə/$ , and so on. As written, however, I don't see how it can fill the latter function. In order to allow for the palatalization

of the *t* in *fietsje*, the optional element in the environment would have to appear to the *right* of the focus. *n*, which is [+son], would still not be handled. I will not go into a revision of the rule here, since it is irrelevant to further discussion.

$$(7) \begin{bmatrix} +\text{son} \\ -\text{voc} \\ -\text{cons} \\ +\text{high} \end{bmatrix} \longrightarrow \emptyset \quad / \quad \begin{bmatrix} -\text{son} \\ -\text{ant} \\ +\text{cor} \end{bmatrix} \text{ \_\_\_\_\_\_ }$$

This rule allows for a dropping of the *j* after palatalization of the preceding consonant. Illustration of its workings can be found in profusion above.

#### 4. Problems with the standard analysis

As I see it, there are at least three important sets of exceptions in standard Dutch to the rules and rule ordering given above. Briefly, these concern alternations like those given in (8 i-iii) below:

(8) i.	<i>wiel</i>	‘wheel’	<i>wieltje</i> <i>wieletje</i>
	<i>bloem</i>	‘flower’	<i>bloempje</i> <i>bloemetje</i>
ii.	<i>hemd</i>	‘shirt’	<i>hemdje</i> <i>hempje</i> <i>hemmetje</i>
	<i>beemd</i>	‘meadow’	<i>beemdje</i> <i>beempje</i>
	iii. <i>weg</i>	‘way’	<i>wegje</i> <i>weggetje</i>
	<i>big</i>	‘piglet’	<i>biggetje</i>
	<i>kip</i>	‘chicken’	<i>kipje</i> <i>kippetje</i>
	<i>schrab</i>	‘scratch’	<i>schrabje</i> <i>schrabbetje</i>

In each case (except *big*, which apparently has no diminutive *bigje*) only the first of the set of possible diminutives can be produced by H-L & K’s rules in the given order. H-L & K are, of course, aware of these examples, as various discussions found throughout their article show. Yet it is not

clear how they can be integrated into the framework set up for the rest of the diminutives. Below I discuss the various classes of exceptions, the status they are given in H-L & K's discussion, and the very real problems they present for a generative model of phonology.

4.1. H-L & K give a brief outline on pp. 9-10 of the type of counter-example presented by diminutives like *wieletje* and *bloemetje*. The problem, of course, rests in the fact that the stem vowels found in these examples have all traditionally been assigned to the class of tense vowels, which would mean, in a generative system, that they would be given the feature [+tense]. Yet in taking the ending *-etje* they are following the pattern of [-tense] vowels, as a look at rule (2) shows.

A glance at the form of these apparent exceptions yields two facts which may help explain their exceptionality: 1) They all contain the vowels *ie* [i], *uu* [ü] or *oe* [u]; 2) The positive forms all end in *m*, *n* or *l* (thus specifically *not r*). Now it is a recognized fact (clearly discussed, for example, in Moulton 1962) that these three vowels are in general not as long or as tense as the other 'tense' vowels, *except in the environment of a following r*. It is clearly no accident that it is these vowels which are here acting like lax vowels, and that they do not do so before a stem final *r*.

H-L & K suggest, then, that /i/, /ü/ and /u/ do not need to be specified as [+tense] underlyingly, and thereby consider the problem as at least somewhat solved. But of course it isn't. This solution opens up a Pandora's box of questions and problems which H-L & K do not address. For if they are talking about a simple lack of any specification for [tense] in these vowels underlyingly, thus [Otense], we are thrown back to the problems considered by Stanley in his 1967 article on such markings, and specifically to the question of how a rule which specifies + or - for some feature is supposed to be applied to a *O*. For note that rule (2), that rule which these exceptional items undergo, specifically requires a [-tense] marking on the final stem vowel.

If, on the other hand, H-L & K simply mean that /i/, /ü/ and /u/ do not *have* to be marked [+tense], but may be marked either [+tense] or [-tense], we have another problem. For not all words of the requisite shape show the *-etje* option (they note, for example, that *kiemetje* 'little germ' is questionable). In these words, presumably, the vowel would be marked [+tense], in others, like *bloem*, it would be marked [-tense] (granting the assumption that *bloemetje* speakers are not also *bloempje* speakers). Unfortunately, this would be totally circular, and hardly explanatory. In point of fact, there is no such tenseness distinction between

the vowels of *kiem* and *bloem* on the surface, and no independent reason for assuming one underlyingly.

A final possibility, which is not really brought up in H-L & K, is that of marking all instances of /i/, /ü/ and /u/ as [-tense] underlyingly, and further marking all words which do not undergo rule (2) as exceptions to the rule (words with following *r* wouldn't need this kind of marking, since they would presumably undergo a tensing rule before (2) applied). While much closer to the phonetic facts, this solution carries with it the burden of an inordinate number of lexical markings, not to mention the difficulty of marking words like *bloem* as optional exceptions to the presumably obligatory rule (this time assuming that a single speaker may produce both *bloemetje* and *bloempje*).

4.2. The second group of exceptions cited in (8) is perhaps even more serious for the standard analysis, since without some modification of the apparatus there does not appear to be any solution at all, unwieldy or not. H-L & K do not appear to recognize this fact, however. To quote them (p. 11, translation mine):

The forms *hempje* from *hemd* and possibly *beempje* beside *beemdje* from *beemd* are regular; in *hemt-tje* there is only one *t* left [after rule (4):OWR], after which the assimilation rule *mtje* becomes *mpje* is applied, or, according to the *-etje* rule, the diminutive becomes *hemmetje*.

The trouble is, their rules do not apply in that order. By the time any *t* gets deleted in /*bemt#tjə*/ or /*hɛmt#tjə*/, rules (2) and (3) have been passed. This is in fact the reason for ordering them that way. Their ordering can only account for the forms *beemdje* and *hemdje*. To get *beempje* and *hempje*, (4) would have to be ordered before (3). To do this, either one would have to assume that *hempje* speakers are also *ampje* and *beempje* speakers (although it is my impression that *beempje* is much less common than *hempje*, and that *ampje* is not found at all), and furthermore that if a given person says *beempje* he does not also say *beemdje*, or one must assume a variable ordering of rules (3) and (4), with individual lexical items somehow being marked for the uncommon ordering of (4) before (3) (the marking being perhaps, again *somehow*, an optional element).

With *hemmetje* the situation is even worse. For here one simply cannot assume any general ordering, in any given group of speakers, of (4) before (2). This would result in forms like *lannetje* opposite *land*, which is, as



far as I know, totally bad. The only option here is to mark *hemd* as an exception to the normal ordering of (2) before (4), with the marking again perhaps having to be optional even for an individual speaker.

4.3. The third group of exceptional examples is also very interesting, although for a different reason. In this case, there is nothing that one could conceivably do with rule ordering which would generate the *-etje* form. The fact is, at no point along the way do underlying forms like */vex#tjə/* meet the conditions for *ə*-insertion, since this requires a preceding sonorant. Accordingly, while H-L & K mention this group of exceptions, they do not even attempt to generate them (p. 10).

One possibility, that chosen by Cohen 1958, is to take these forms as being simply irregular, which, as I understand it, involves not attempting to formulate a rule for them. The equivalent to this in a generative theory is the marking of these items as [+Rule 2], while also including the feature [+Rule 2] as an *environment* for the application of the rule. The *ad hoc* nature of markings like these is, however, immediately apparent. Furthermore, such a solution overlooks some very interesting characteristics of the exceptions in question, to wit: 1) They all contain stressed lax vowels; 2) A single consonant follows that vowel. The similarity of these conditions to those specified for the application of rule (2) is clear. The only difference is that these items have single *nonsonorant* consonants following the vowel, while rule (2) specifies that the consonant in question be [+sonorant].

Other things being equal, even standard generative phonology would consider natural the extension of a rule's applicability from an environment like that given in rule (2) to one without the specification [+sonorant] on the preceding consonant.<sup>4</sup> The problem is, only a limited number of items with final nonsonorants at present follow the *-etje* rule. The overwhelming number of items with final nonsonorants still have a single diminutive in *-je*. This makes it difficult to claim, as standard generative theory would perhaps like to do, that a rule simplification has taken place here. What kind of simplification is it, after all, which results in a massive increase of [-Rule] markings in the lexicon (for all items with final nonsonorants which do not (yet) have a diminutive in *-etje*)?

What we seem to have here, in fact, is a case of 'lexical diffusion' at its beginning stages (cf. Wang 1969, Chen and Wang 1975). As I have argued elsewhere (Robinson 1977a, Leben and Robinson 1977, Robinson 1978d), such cases are always difficult to describe in a theory which, like generative phonology, holds rules responsible for the actual produc-

tion of pronunciations. Given a change in a rule, one expects an immediate (and lexically abrupt) change in surface items. Lexical gradualness would seem to argue for a much looser relationship between surface items and phonological rules, specifically not one in which the former are more or less secondary byproducts of the latter.

### 5. 'Upside-down' phonology

The theory of 'Upside-down' phonology (UDP) postulates just such a relationship between surface items and phonological rules. In this theory (first introduced in Leben and Robinson 1977), it is claimed that the lexicon of a language consists, not of morphemes in a shape abstracted from all allomorphy, but of words in a shape very close to or identical with their surface phonetic pronunciation. Phonological rules, although deprived in this way of their standard function of generating pronunciations, are nevertheless important in two ways: 1) As redundancy rules, they account for the very definite structure found in the phonetics of a language, thus characterizing the notion 'pronounceable in L'; 2) As 'parsing' rules, they allow surface items to be related to one another via morphological rules of the language.

It is the latter function of phonological rules which will principally concern us here. To illustrate how it works, I have given in (9) a sample derivation for the positive/diminutive pair *das/dasje*, using only those of H-L & K's rules which are relevant to this particular alternation:

(9)	<i>A</i>	<i>B</i>	<i>Morphology</i>
	$[das]_N$	$[da\check{s}\partial]_N$	$[N-tj\partial]_N[+dim]$
Rule (7)	_____	$[da\check{s}j\partial]_N$	_____
Rule (6)	_____	$[dasj\partial]_N$	_____
Rule (4)	_____	$[dastj\partial]_N$	_____

As can be seen above, the impetus for a 'derivation' in UDP is a question or hypothesis: Given two surface forms (in this case  $[das]$  and  $[da\check{s}\partial]$ ), and given the morphological rules of the language, are the forms relatable to one another by the morphological rules? In some cases, that question can be answered without the mediation of any phonological rules at all. In other cases, however, like the one above, the morphology will fail to relate items in their surface form. This being the case, one turns

to the phonological rules. These are set up in a certain order (of which more later), and the procedure is as follows: In the order given, phonological rules are checked against the items being compared to see whether their output matches the form of one or both of the given items. If so, one *may* be justified in 'undoing' the application of the rule by 'restoring' the pre-rule form of the item in question. There are two important criteria that must be met before this is done, however: 1) Such an 'undoing' must be necessary; that is, a rule may not be undone if, for example, the items are already relatable via the morphology; 2) Intimately connected with the first condition: The specific features or segments inserted or deleted by this 'undoing' of the rule must be supported by reference to the other terms of the comparison. The workings of this second condition, and its implications, have been more formally presented in Robinson 1978b, so I will not go into them in detail here. It should be pointed out, however, that the first condition on application is actually a subcase of the second condition.

In the derivation given above, then, rule (7) is undone first. *j* is inserted in the form [dašə], yielding [dašjə]. The motivation for this *j* is found in the morphological rule itself, which contains the sequence *tjə*.<sup>5</sup> Subsequently, rule (6) is undone on [dašjə], yielding [dasjə]. In this case, evidence for the *s* comes from [das]. Finally, rule (4) is undone, yielding [dastjə]. At this point, the morphological rule may come into play, finding the two forms to be related.

In several recent articles, I have investigated some implications of such a phonological parsing procedure which will be relevant to further discussion here. The first has to do with rule ordering (cf. Robinson 1978d), and the argument runs as follows: Given that the function of phonological rules is to allow the morphology to relate words to one another, rather than to generate those words from more or less abstract unitary morphemes, it follows that rules should be ordered in such a way as to make possible a maximal interaction between them, in case it should be needed. Specifically, within such a model there is no obvious reason to order rules in what is commonly characterized as a 'bleeding' or 'counter-feeding' fashion, since the sole function of such orderings is to *prevent* one of the two rules in question from applying when the other does. In fact, as I argue in Robinson 1978d, potentially 'feeding' rules should always be ordered in a (backwards) 'feeding' order, potentially 'bleeding' rules in a 'counter-bleeding' order. If, in a given derivation (or in *all* derivations of a given language), one of the rules fails to apply when the other does, this is predictable from the input surface forms, and need not be captured by rule ordering. Thus it seems to be the case

that in 'Upside-down' phonology rule ordering is an essentially language-independent thing, being based solely on the (universal) parsing function of phonological rules.

The second implication of the parsing model which is relevant to our problem here is the following (cf. Robinson 1978c): Since in the parsing model surface pronunciations are no longer mere products of the phonological rules, but are stored independently in the lexicon, the possibility exists that a discrepancy may arise between those surface forms and the phonological rules which relate and structure them. This discrepancy may logically come about in two ways: 1) Phenomena may arise on the surface which are not predicted by the phonological rules (borrowing may be a major factor here); 2) Changes may take place in the phonological rules which are not immediately reflected on the surface.

It is changes of the second type which will interest us here. In Robinson 1978c I make reference to Andersen 1973, in which a type of change Andersen calls 'abductive' is illustrated and defended. An 'abductive' change in a language may take place, says Andersen, when language learners infer from the phonetic output of their models underlying structures different from those that produced that output. Given further data from their models which contradict the underlying structures they have already set up, language learners may do one of two things: They may modify their underlying structures in line with the new data, or they may simply keep their own (innovative) structures, while at the same time, on a word for word basis, memorizing the adult data which contradict them. This may involve, at first, a massive amount of such memorization. But in the course of time (and over several generations), more and more of the surface items involved will change permanently in order to reflect the new underlying structures. In later generations, these surface changes will be all the more acceptable to the adult models since they directly implement their own (more repressed) underlying structures.

It should be clear how well this postulated process ties in with the theory of 'lexical diffusion' mentioned earlier. The spreading out of a phonological (surface) change over time, and even the S-shaped curve associated with known cases of lexical diffusion (a few items changing at first, then a sudden burst in surface changes, and a final slow change in residual items, cf. Chen 1972), square quite well with Andersen's theory.

But both of these theories fit exceedingly well within an 'upside-down' model. Because of the looser connection between surface words and phonological rules, changes may initially take place in the rule component which are not directly reflected on the surface. But because of the very

function of phonological rules in this model (that of structuring surface items and relating them to each other), the connections between surface items and rules cannot become too loose. If they did, either the rules would become totally opaque (and impossible to learn), or the items, for want of necessary redundancy, would become increasingly difficult to learn, and the relations between them too difficult to unravel. Thus the gradual adjustment, in 'abductive' change cases, of surface items to transparently reflect the (innovative) phonological rules.

The relevance of these considerations to the Dutch diminutive will be discussed in the next section.

### 6. *Wioletje hemmetje and weggetje in 'Upside-down' phonology*

6.1. In my 'upside-down' treatment of the exceptional diminutives, I should perhaps begin with the *hemmetje*, *hempje*, *beempje* group. It must be remembered that the overwhelming problem with these in a standard treatment was the apparent violation of normal rule ordering in their derivation. Thus in *hemmetje* rule (4) has apparently been applied before rule (2), although for most items of the language it must follow (2), and in *hempje*, *beempje* (4) has been applied before (3) when it in general follows that rule (N.B. in the case of *hempje* we must carefully specify that (4) precedes (3) but follows (2), otherwise only *hemmetje* would surface).

This problem rapidly dissolves if we study the motivations, within standard theory, for the so-called normal ordering. In fact, the only reason for ordering rule (4) after (2) and (3) is to prevent the latter rules from applying to the output of the former. Or to put it another way: The rules are ordered as they are precisely so that they may never apply in the same derivation.

Such a motivation of course in no way applies to the specification of rule order in an 'Upside-down' phonology. In this framework, rules are ordered so as to allow for maximal possible interaction between them in derivations, even if this is in most cases not necessary. And in fact, for most Dutch diminutives it makes absolutely no difference whether rule (2) is ordered before or after (4) in backwards derivation. Thus to relate the possible (and from the point of view of a standard model regular) diminutive [*hemčə*] to [*həmt*], the placement of rule (2) is irrelevant, since neither of the forms matches the output of that rule, and it will thus simply never apply. Yet there is a logical ordering in which both rule (4) and rule (2) could apply in the same forms, namely the backwards one of (2) before (4). In the same way, the backwards order of (3) before (4)

would allow both rules to apply in a single derivation. This being the case, in 'Upside-down' phonology the choice is clear: Both (2) and (3) must precede (4) in the backwards ordering of rules of the language. Interestingly enough, the ordering of (2) and (3) with respect to each other remains free. In neither possible order can these two rules interact in the same derivation.

Now if rules (2) and (3) may (in fact, for universal reasons, must) precede rule (4) in backwards derivations, the intractability of forms like *hemmetje*, *hempje* and *beempje* disappears, as the following derivations show:

(10)	<i>A</i>	<i>B</i>	<i>B'</i>	<i>B''</i>	<i>Morphology</i>
	[ <i>hɛmt</i> ] <sub>N</sub>	[ <i>hɛmčə</i> ] <sub>N</sub>	[ <i>hɛmpjə</i> ] <sub>N</sub>	[ <i>hɛmɔčə</i> ] <sub>N</sub>	[ <i>N-tjə</i> ] <sub>N</sub> [+dim]
Rule (7)	_____	[ <i>hɛmčjə</i> ] <sub>N</sub>	_____	[ <i>hɛmɔčjə</i> ] <sub>N</sub>	_____
Rule (6)	_____	[ <i>hɛmtjə</i> ] <sub>N</sub>	_____	[ <i>hɛmɔtjə</i> ] <sub>N</sub>	_____
Rule (3)	_____	_____	[ <i>hɛmtjə</i> ] <sub>N</sub>	_____	_____
Rule (2)	_____	_____	_____	[ <i>hɛmtjə</i> ] <sub>N</sub>	_____
Rule (4)	_____	[ <i>hɛmttjə</i> ] <sub>N</sub>	[ <i>hɛmttjə</i> ] <sub>N</sub>	[ <i>hɛmttjə</i> ] <sub>N</sub>	_____

(The ordering of rule (3) before (2) is, as noted above, arbitrary. So, as far as I can see, is the ordering of rules (7) and (6) before (3). (7) must of course be ordered before (6)).

Granting, then, that *hemmetje*, *hempje* and *beempje* can be handled in this model without any kind of lexically-marked variable rule ordering, one might still ask why they differ from other diminutives in the applicability of both rule (4) and (2) or (3) in their derivations. Or to put it another way, why aren't these diminutives simply [*hɛmčə*] and [*bɛmčə*]? The answer, I think, lies in the notion of 'rule transparency', which, as I have argued elsewhere, is a very important one in 'Upside-down' phonology. To quote from Robinson 1978c: 333:

Given that one of the functions of phonological rules is to express redundancies present in surface lexical items, and thus to capture the degree of structuredness of the entire lexicon, items which on the face

of it violate such a rule represent points of weakness, of undesirable complexity in the structure, and will be under some pressure to change to a less deviant form.

Looked at in this light, it seems fairly clear that, 'on the face of it', [hɛmčə] and [bɛmčə] constitute counterexamples to either rule (2) or rule (3), counterexamples in the sense that, formally at least, they look as if they should have undergone the rules in question and didn't. The solution to this problem is obvious, of course: Change the items in line with the violated rules. For [hɛmčə] this may take either one of two directions, to [hɛmpjə] in line with (3) or [hɛmǎčə] in line with (2). In either case, there is no longer a surface variation of either rule. For [bɛmčə] there is only one direction to take, namely that of rule (3) to [bɛmpjə].

Even with this explanation, there is one further question which should be addressed: If [hɛmčə] has folded under the pressure of rule (2) and gone to [hɛmǎčə], why haven't words like [lančə] 'little land' done the same? Why don't we find forms like [lanǎčə]? The following partial answer is speculative.

It should be remembered that the form [hɛmčə] is an apparent violation on the surface of not just one rule, but two. Given its form, it should either have undergone rule (2) to [hɛmǎčə], or rule (3) to [hɛmpjə]. Application of either rule ends up satisfying the desire for transparency. But what of [lančə]? While it seems a fairly clear violation of rule (2), it is perfectly in line with rule (3). Furthermore, it seems quite parallel with forms like [lampjə] 'little lamp', [pɪŋkjə] 'little finger', which violate no rules on the surface.

I speculate, then, that the real reason [hɛmčə] has gone to either [hɛmǎčə] or [hɛmpjə] does not have to do with its violation of rule (2) after all. It is the violation of rule (3) that really matters. While the *-etje* rule is a very productive rule of Dutch, it is, in the final analysis, principally or exclusively a rule dealing with the diminutive suffix. Rule (3), on the other hand, is simply one aspect of a very general phonetic tendency in Dutch to avoid clusters of nonhomorganic consonants. As H-L & K point out (p. 18), the same general tendency is reflected in a prefix like *on-* 'un-, in-' when it appears before noncoronal consonants, cf. *o[m]buigzaam* 'inflexible', *o[m]meetbaar* 'immeasurable'.

6.2. Within the parsing model, forms like *wieletje* and *bloemetje* are also no problem. On the surface, at least, [i], [ū], and [u] are [-tense] (except before *r*), and it is thus not at all unusual that positive forms containing these vowels followed by a single *m*, *n*, *l* should follow rule (2) in the

diminutive. What needs explanation, in fact, is the existence of all the forms in *-tje* and *-pje*. And yet this too is no real problem. For it seems clear that [i], [ü] and [u] were at least at one time genuinely tense vowels (cf. Moulton 1962:310-12), and it would appear that the *-tje* and *-pje* diminutives regularly reflect this earlier situation. Since all of the diminutives are in fact listed separately in the lexicon, rather than being produced by rule each time they are pronounced, there has as yet been no wholesale introduction of the *-etje* forms to bring the diminutives back in line with the rules (specifically rule (2)).

Thus in this case we seem to be at the beginning of a lexically gradual reaction to a historical change (that of [i], [ü] and [u] to [-tense] vowels). And it is only in the parsing model that we can describe such an intermediate stage of change with any facility.

6.3. To handle forms like *weggetje* and *poppetje*, finally, I tentatively suggest the following: The correct formulation of the *-etje* rule in modern Dutch is not in fact rule (2), but something like (11):

$$(11) \emptyset \rightarrow \partial \quad / \quad \left[ \begin{array}{c} \text{V} \\ -\text{tense} \\ +\text{stress} \end{array} \right] [+cons] \text{ — } tj$$

thus without the feature [+son] on the immediately preceding consonant of the environment. Thus I postulate that at some time in the past, language learners, being presented with *-etje* forms in the output of their models, constructed a more general rule to account for them than was warranted by the facts, that they in fact brought about an 'abductive' change in the phonology of Dutch. Forms like *weggetje* would then be individual attempts at a transparentization of rule (11), the vanguard of a potential flood of such forms. Time will of course tell if this is the correct analysis, but for the nonce I see no other way to explain the remarkable similarity between the form of such 'exceptional' items and the environmental specifications for rule (2). And again, it is only within a parsing model, with its looser connection between rules and surface items, that this solution can be contemplated. For any standard generative phonology postulating a rule like (11) for Dutch would, given the natural interpretation of its mechanisms, produce a very large number of forms which are incorrect in present-day Dutch.

Sample 'upside-down' derivations follow for the diminutives *balletje*, *popje* and *poppetje*. It can be seen that the postulation of rule (11) rather than (2) gives us no problems with *popje*, as it would in a standard analy-



sis. The point is, to extent that forms like *popje* exist, they constitute counterexamples to rule (11), and will be under pressure to change.

(12)	A	B'	B''	C	D	Morphology
	[pɔp] <sub>N</sub>	[pɔpjə] <sub>N</sub>	[pɔpəčə] <sub>N</sub>	[bal] <sub>N</sub>	[baləčə] <sub>N</sub>	[N-tjə] <sub>N</sub> <sub>[+dim]</sub>
Rule (7)	_____	_____	[pɔpəčjə] <sub>N</sub>	_____	[baləčjə] <sub>N</sub>	_____
Rule (6)	_____	_____	[pɔpətjə] <sub>N</sub>	_____	[balətjə] <sub>N</sub>	_____
Rule (11)	_____	_____	[pɔptjə] <sub>N</sub>	_____	[baltjə] <sub>N</sub>	_____
Rule (4)	_____	[pɔptjə] <sub>N</sub>	_____	_____	_____	_____

## 7. Conclusion

In this article I have defended the view of phonology, known as 'Upside-down' phonology, first sketched in Leben and Robinson 1977. In particular, I have tried to show that a standard generative treatment of certain positive/diminutive alternations in Dutch is incapable of accounting for several classes of diminutive forms which, when looked at from the point of view of the newer theory, are not only describable (which in itself constitutes an advance over standard theory), but even explainable. Some of these explanations are of necessity tentative and subject to revision, but I feel that they are a step in the right direction. In any case, it should be clear that it is only within the parsing model that these questions of explanation can be coherently formulated.

## Notes

<sup>1</sup> I am considering the [ɔ] of *traktor* to be unstressed here, as H-L & K p. 9 tentatively suggest.

<sup>2</sup> Again following H-L & K, I consider the final vowels of *wandeling* and *leerling* to be stressed, as opposed to that of *paling* 'eel'.

<sup>3</sup> This has important implications for the theory of rule iterativity, as I hope to show in a later article.

<sup>4</sup> As will be clear below, I feel that some such generalization has indeed taken place here. Two points should be mentioned, however: i) Examples of *-etje* after [p], [b] and [ɣ] (or [x]) are fairly common, but examples after other obstruents are rare or absent. In some cases, this may be accidental (a form like *plukketje* from *pluk* 'handful' seems reasonable, and was actually produced by a member of the Leiden

*Werkgroep*, Afra Wamsteker-Meijer), but in some cases it may be structural. Thus there may be some limits on this generalization which are not captured by simply dropping the feature [+son] in rule (2). ii) In some cases, words ending in (underlying) voiced consonants have a longer positive form ending in [ə] (cf. *web/webbe* 'web'). In these cases, one can claim that we are dealing with a perfectly normal *-tje* following the vowel of the long form. Important to note, however, is the fact that in the positive, the short form is more frequent than the long form, while in the diminutive it is the *-etje* form which predominates. I suspect it may be precisely this development which has led to a reanalysis of rule (2), and thus to the spread of *-etje* diminutives to words without long forms.

<sup>5</sup> I have not yet in fact addressed the way in which the phonological material in morphological rules is arrived at. Suffice it to say here that it, too, must be justified by comparison of surface forms, with conditions similar to 1) and 2) above. In the case of affixes, the forms arrived at by such comparison become fixed parts of the morphology, and are available as evidence for the undoing of phonological rules in derivations like (9) above.

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# PAST PARTICIPLE PREFIX *ge*-DELETION AND THE ROLE OF STRESS IN DUTCH COMPLEX VERBS

ANKE DE ROOIJ-BRONKHORST

## 1. Introduction

This paper\* deals with two separate but related issues in the grammar of the verbal system in Dutch:

- (1) formulating the rule of past participle prefix *ge*-deletion (section 3) from the point of view of the language learning child;
- (2) trying to incorporate a set of problematic verbs into the system of regular complex verbs (section 4).

Given the distribution of inflectional prefix *ge*- in verbs with a simple stem and verbs with a complex stem, it will be shown that there is *no* reason for the language learning child to suspect that this is a (partly) stress based phenomenon in Dutch, as claimed by Schultink (1973) and others following him.

Thus, the main contention of this paper is *that ge-deletion is a purely morphological issue in modern Dutch* (section 3). After observing (section 2) how morphological structure, stress and inflectional forms are intimately linked, composing distinct paradigms for the two basic classes of complex verbs, the 'problematic' verbs provide additional evidence for this claim.

Dutch is therefore unlike German in this respect, since in German *ge*-deletion is at least in part stress governed (section 7). However the data which the German child is exposed to, contains clearcut evidence for such an assumption.

From a diachronic point of view, the hypothesis that *ge*-deletion in

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Dutch is stress governed is quite natural. But, based on the data the child is presented with in modern Dutch, it will be shown that this is *not* the case. Whenever the rule *appears* to be sensitive to stress, *reanalysis* of the internal structure of the verbs in question must have taken place (sections 5, 6).

The remaining sections 8 and 9 are devoted to the question of what the evidence is for the category 'samenkoppelingen'<sup>1</sup> ('coupled verbs') (section 8) and to the question how these problematic verbs arose in Dutch (section 9).

## 2

Before discussing *ge*-deletion, I would like to point out some interesting correlations between *morphological structure*, *stress* and *inflectional forms* of *complex verbs* in Dutch. It will be shown that this correlation plays an important role in the way speakers deal with the verbs of section 4.

There are two major classes of complex verbs in Dutch, one derived by *prefixation* and one called *samenkoppelingen*, derived by 'coupling' a particle, adjective or noun and a verb to a structure that is not a *word* syntactically, but a *phrase*.

Each class has its own, consistent stress pattern. Therefore, since prefixations and *samenkoppelingen* have different morphological structures, we may expect that the *stress pattern* and *morphological structure* of complex verbs are closely linked for speakers of Dutch.

It will also be observed that prefixations and *samenkoppelingen* show a consistent pattern of *inflectional forms*. Thus for the two classes of complex verbs, *two distinct regular paradigms* obtain:

morphological structure (1, 2)  $\begin{matrix} \searrow \\ \rightarrow \end{matrix}$  stress pattern (1, 2 resp.)  
 $\searrow$  inflectional forms (1, 2 resp.)

The reverse then will also hold (since it will be shown that the two paradigms are disjoint in all respects), namely that stress pattern and inflectional forms serve as clues for assigning morphological structure to input data:

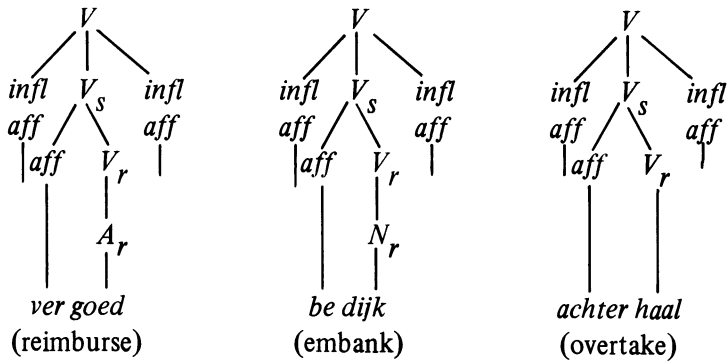
stress pattern (1, 2)  $\begin{matrix} \rightarrow \\ \searrow \end{matrix}$  morphological structure (1, 2 resp.)  
 $\rightarrow$  inflectional forms (1, 2)

It is therefore not surprising to find that in a situation where there is a match-up of a morphological structure of class 1, and a stress pattern of

class 2, the language learner is faced with an as yet unsolved problem (see section 4), namely *what* morphological analysis to assign to verbs of this type. It will be shown that speakers have multiple structural analyses associated with this type of verb, and 'waver' between them, not certain which is the correct analysis, which is reflected in the different inflectional forms.

### 2.1 Class 1 of complex verbs:<sup>2</sup> Prefixations

Class 1 complex verbs are derived from an adjective, noun or a verb root,<sup>3</sup> and two types of prefixes:<sup>4</sup> those that do not occur independently, like *ge-*, *ver-*, *be-*, *er-*, *onto-* and *her-* (bound morphemes, but see section 9) and those that are homophonous with prepositions and/or adverbs like *aan-*, *over-*, *achter-*, *voor-*, *door-*, etc. The result of joining a prefix and a root is a verb *stem*, onto which optionally affixes are attached. Prefixations thus have the following structure:



The *main stress* of prefixations is never on the prefix (but see section 4); the *inflectional paradigm* for prefixations is the following:

*finite forms:*

in main clauses, where Verb-second operates (for rules see Appendix), the verb is fronted as a whole (as expected):

*De boer bewérkte zijn land.*

(The farmer cultivated his land)

*past participles:*

Normally, past participles are formed by adding a prefix *ge-* and a suffix *-d* onto the stem. *ge-* deletes before a prefixed verb:

*De boer heeft zijn land bewérkt. (\*gebewérkt)*

(The farmer has his land cultivated =

The farmer has cultivated his land)

*infinitives:*

with marker *te* (to), its presence governed by the preceding verb:

*De boer weigerde zijn land te bewérken.*

(The farmer refused his land to cultivate =

The farmer refused to cultivate his land)

The *inflectional forms* thus confirm the status of prefixations as verb *stems*: all inflectional material occurs either to the right or to the left of the verb stem as a whole. The *relative prominence pattern* of these verbs is  $\hat{W}S$ , i.e. on the surface, the *root* is always prominent:

*bewérken*

(cultivate)

*vergoéden*

(make up for)

*verbouwen*

(cultivate)

*aanvâarden*

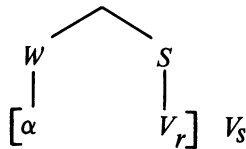
(accept)

The *grammatical paradigm* for prefixations thus is the following:

*morphological structure:*  $[[\alpha]_{aff} [X]_{V_r}]_{V_s}$

(where  $\alpha$  and  $X$  are lexical items of the appropriate categories)

*stress:*



*inflectional forms:*

finite forms

$[[[\alpha]_{aff} [X]_{V_r}]_{V_s^{de}}]_V$

past participle

$[\phi [ [\alpha]_{aff} [X]_{V_r} ]_{V_s^d}]_V$

infinite

$te [ [ [\alpha]_{aff} [X]_{V_r} ]_{V_s^{en}} ]_V$

(For rules see Appendix)

## 2.2 Class 2 of complex verbs: *Samenkoppelingen*

Class 2 complex verbs consist of what traditionally have been called 'separable prefixes' and verb stems. Also possible are *samenkoppelingen* in which the nonverbal part is a noun or adjective. Examples are:

<i>óverlòpen</i>	(defect, overflow)
<i>dóorhàlen</i>	(scratch out)
<i>toégèven</i>	(admit)
<i>méemàken</i>	(experience)
<i>vlámvàtten</i>	(catch fire)
<i>goédkeùren</i>	(approve, see fit)

There are also *samenkoppelingen* in which either the verbal part does not exist independently (a) or the nonverbal part (b):

- |     |                      |                  |                        |
|-----|----------------------|------------------|------------------------|
| (a) | <i>ópmònteren</i>    | <i>*monteren</i> | (cheer up)             |
|     | <i>mískleùnen</i>    | <i>*kleunen</i>  | (miss, make a mistake) |
|     | <i>áftuigen</i>      | <i>*tuigen</i>   | (unharness, beat up)   |
|     | <i>ópdoèken</i>      | <i>*doeken</i>   | (do away with)         |
| (b) | <i>gádeslaàn</i>     | <i>*gade</i>     | (watch, observe)       |
|     | <i>teleúrstèllen</i> | <i>*teur</i>     | (disappoint)           |

For a further discussion of *samenkoppelingen*, see section 8.

The *stress pattern* of *samenkoppelingen* is the following:

*méemàken doórhàlen goédkeùren vlámvàtten*

I.e. the main accent is on the *nonverbal* part.

*Inflectional forms* of *samenkoppelingen*:

*finite forms*:

in main clauses, where Verb-second operates, only the verbal part is fronted:

*Jan haalde alles weer door.*

(John scratched everything again out =  
John scratched everything out again)

*Het hout vatte moeizaam vlam.*

(The wood caught slowly fire =  
The wood caught fire slowly)

*past participles*:

*ge-* is added to the verbal part of the *samenkoppeling* (the stem):

*Jan had alles weer doorgehaald.*

(John had everything again out scratched =  
John had scratched out everything again)

*infinitives*

marked by *te (to)*:



*Jan probeerde alles weer uit te halen.*

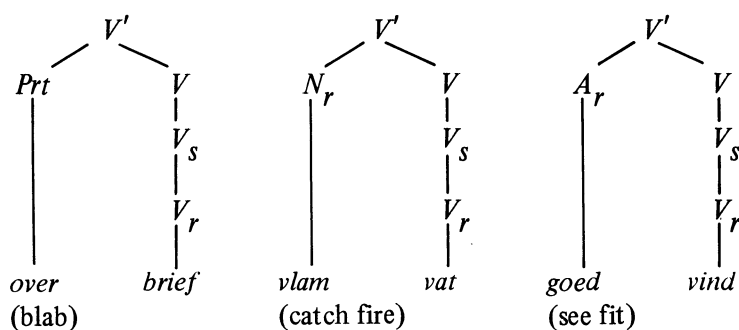
(John tried everything again out to scratch =

John tried to scratch out everything again)

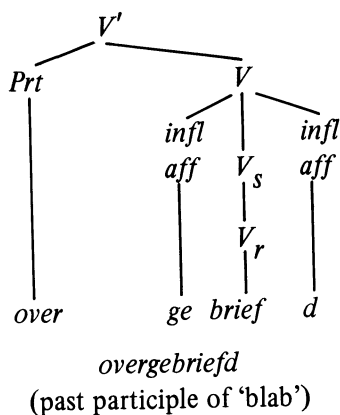
*Morphological structure of samenkoppelingen:*

From the above it is evident that *samenkoppelingen* are not *words*, if one of the criteria for a word is its internal unseparability. However, while *samenkoppelingen* may not be syntactically units, semantically they are (see also section 8).

Verb-second moves only the *verbal* part of *samenkoppelingen*. Transformations never *reach into* the internal structure of lexical categories. Therefore, if there is a node dominating *samenkoppelingen*, it has to be a node labelling a *phrasal* structure. Given the fact that *samenkoppelingen* have properties that configurations produced by the normal phrase structure rules do not have, I will assume that they have the following structure:



$V'$  is the node dominating the *samenkoppeling* (not to be confused with  $\bar{V}$ ),  $V_s$  is dominated by  $V$ , to which the inflectional affixes are attached, as following:



The *grammatical paradigm* for *samenkoppelingen* thus is the following:

*morphological structure*:  $[ [\alpha]_H [ [X]_{V_s} ]_V ]_{V'}$

where  $\alpha$ ,  $X$  are lexical items,  $H = \text{Prt}$ ,  $A_r$  or  $N_r$

*stress*:



*inflectional forms*:

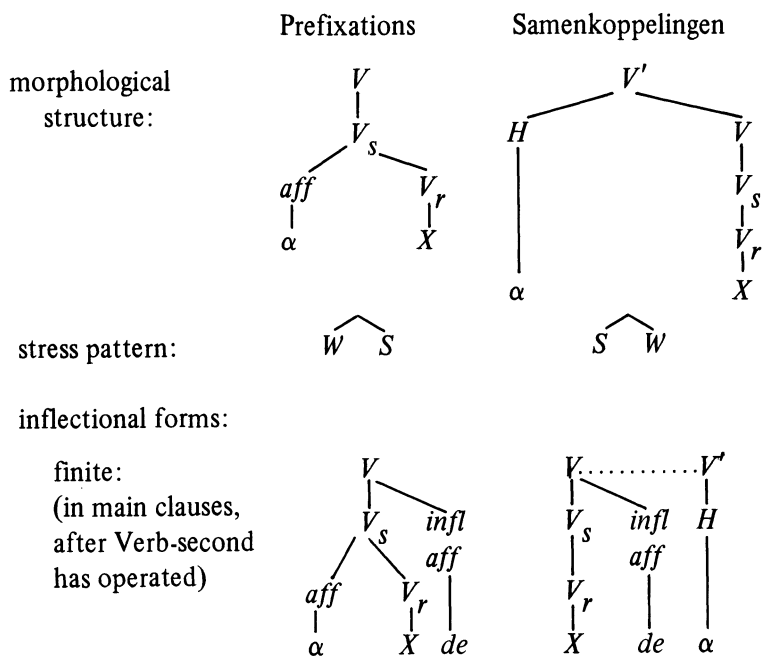
finite forms:  $[ [X]_{V_s} de ]_V \dots [ [\alpha]_H \phi ]_{V'}$

past participles:  $[ [\alpha]_H [ge [X]_{V_s}^d ]_V ]_{V'}$

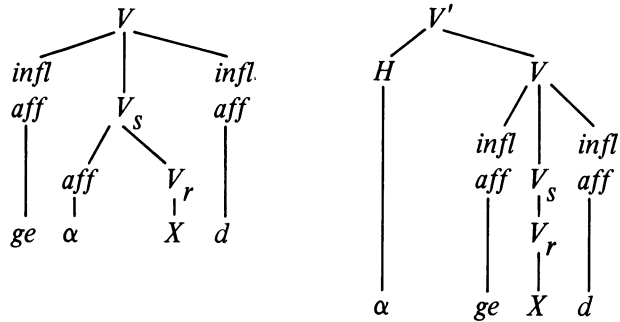
infinitives:  $[ [\alpha]_H te [ [X]_{V_s}^{en} ]_V ]_{V'}$

(For rules see Appendix)

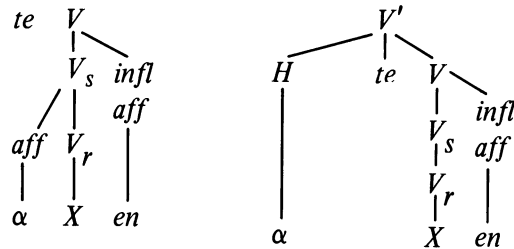
Schema of the two paradigms of complex verbs in Dutch (in tree-configuration<sup>5</sup>):



past participles:



infinitives with *te*:



The language learning child, then, is presented with two *distinct* sets of data, one for each major class of complex verbs. Once s/he has mastered the rules involved, s/he will be able to draw the following inferences:

Lexical entry      [ [ver]<sub>aff</sub> [voeg]<sub>V<sub>r</sub></sub> ]<sub>V<sub>s</sub></sub>      (conjugate)

will have a  $\widehat{W}S$  prominence pattern, and will have the following inflectional forms:

finite:              [ [ [ver]<sub>aff</sub> [voeg]<sub>V<sub>r</sub></sub> ]<sub>V<sub>s</sub></sub> de ]<sub>V</sub>      *vervoegde*

past participle:    [  $\phi$  [ [ver]<sub>aff</sub> [voeg]<sub>V<sub>r</sub></sub> ]<sub>V<sub>s</sub></sub> d ]<sub>V</sub>      *vervoegd*

infinitive:          *te* [ [ [ver]<sub>aff</sub> [voeg]<sub>V<sub>r</sub></sub> ]<sub>V<sub>s</sub></sub> en ]<sub>V</sub>      *te vervoegen*

And, presented with the following data:

*vervóeg*  
*vervóegde*  
*vervóegd*  
*te vervóegen*

the child will, given the close correspondence between stress, inflectional forms and morphological structure of complex verbs, posit the following analysis for the verb in question:

$$[ [ [ver]_{aff} [voeg]_{V_r} ]_{V_s} ]_V$$

The same will be true for *samenkoppelingen*:

Morphological structure:  $[ [in]_{prt} [ [ [voeg]_{V_r} ]_{V_s} ]_V ]_{V'}$  (insert)

will have an  $\hat{S} \hat{W}$  prominence pattern, and will have the following inflectional forms:

finite:  $[ [ [voeg]_{V_r} ]_{V_s} de ]_V \dots [ [in]_{prt} ]_{V'}$  *voegde in*  
(in main clauses)

past participle:  $[ [in]_{prt} [ge [ [voeg]_{V_r} ]_{V_s} d ]_V ]_{V'}$  *ingevoegd*

infinitive:  $[ [in]_{prt} te [ [ [voeg]_{V_r} ]_{V_s} en ]_V ]_{V'}$  *in te voegen*

And, again, presented with any of the following data:

*in vòeg*  
*voègde in*  
*ingevòegd*  
*in te vòegen*

the child will posit the following analysis for the verb in question:

$$[ [in]_{prt} [ [ [voeg]_{V_r} ]_{V_s} ]_V ]_{V'}$$

So, on the one hand, a particular entry will result in a particular paradigm of stress and inflectional forms, associated with the morphological analysis of that entry, and on the other hand, any member of the paradigm will be associated with a particular morphological analysis.

And indeed, we will see in section 4, that problems arise for speakers of the language in cases where this symmetry is broken, problems which are not (yet?) solved even by adult speakers.

Now, let us turn to the phenomenon of past participle prefix *ge*-deletion. It should be said at the outset, that inflectional *ge*-deletion in *German* is governed by a different rule, for a discussion see Kiparsky (1966) and Schultink (1973).

The most obvious difference between German and Dutch in this respect, is that German deletes *ge*- of the past participle even in cases where the verb *stem* is *simple*, i.e. does not contain a derivational affix:

*studiert* but *\*gestudiert* (studied)

whereas Dutch does not delete *ge*- in this environment:

*gestudeerd* but *\*studeerd*<sup>6</sup>

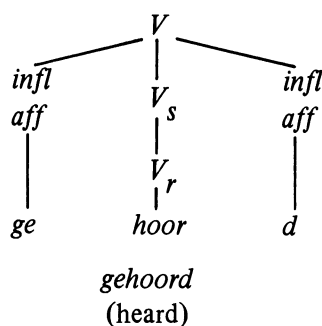
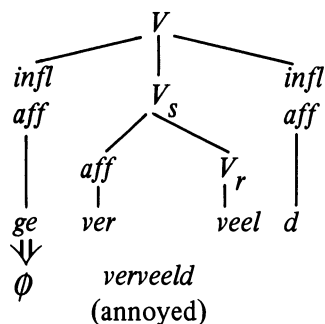
Note that the main stress of the stem is not on the first vowel, which governs *ge*-deletion in German in these cases.<sup>7</sup> Forms like ‘*überbelàstet*’ and ‘\**geüberbelàstet*’ (which one would expect if stress were the only condition governing *ge*-deletion), show that morphological structure also plays a role in the process.

I will argue that in Dutch, inflectional *ge*-deletion is a purely morphological phenomenon.

### 3. Past participle prefix *ge*-deletion rule

The effect that the rule has is that inflectional prefix *ge*- deletes in the following environment:

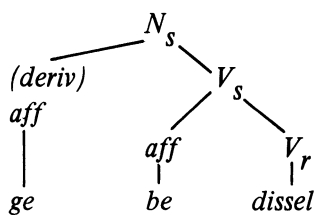
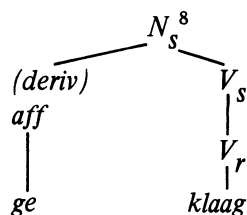
but not in:



Thus, the presence of a derivational affix apparently causes *ge*- to delete. Before we can formulate the rule more precisely, we have to make sure that *ge*- does not delete in the following instances:

- gekláag* : ‘the continuously complaining’
- gezéur* : ‘the continuously nagging’
- gebedíssel* : ‘the continuously manoeuvring’
- geversiér* : ‘the continuously decorating, fixing’

This *ge*- does not delete, however, if it is the *derivational* affix *ge*- that forms action nominals from verb stems, so the structure of these forms is presumably the following:



(although there are only a few examples of this type)

So it is the *inflectional* prefix *ge-* which deletes before a derivational prefix:

Rule of *ge-deletion*:

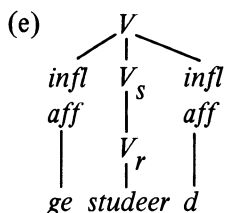
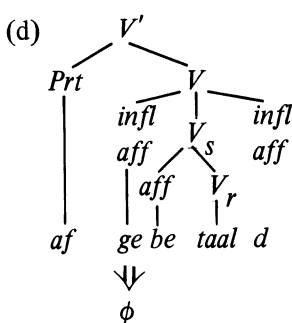
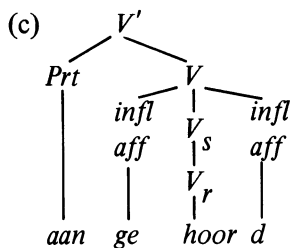
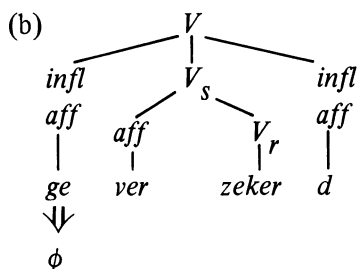
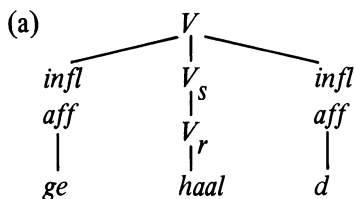
$$\left[ \begin{array}{c} \textit{inflect} \\ \textit{aff} \end{array} \right] \rightarrow \phi / \text{---} \left[ \begin{array}{c} \textit{deriv} \\ \textit{aff} \end{array} \right] \quad (\text{preliminary version})$$

(There are several inflectional affixes in the Dutch verbal system, *-en*, *-t*, *-de(n)*, *-d*, *-te(n)*, and *ge-*, but there is only one inflectional affix that can *precede* a derivational affix, namely the prefix *ge-* of the past participle.)<sup>9</sup>

This rule correctly predicts the following past participles:

- |     |                   |                |            |
|-----|-------------------|----------------|------------|
| (a) | <i>geháald</i>    | (*háald)       | (fetched)  |
| (b) | <i>verzèkerd</i>  | (*geverzèkerd) | (insured)  |
| (c) | <i>áangehòord</i> | (*áanhòord)    | (listened) |
| (d) | <i>áfbetaald</i>  | (*áfgebetaald) | (paid off) |
| (e) | <i>gestudeérd</i> | (*studéerd)    | (studied)  |

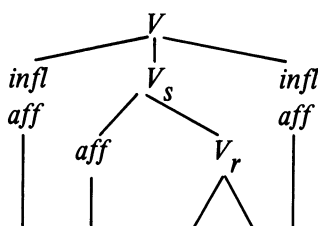
In tree:



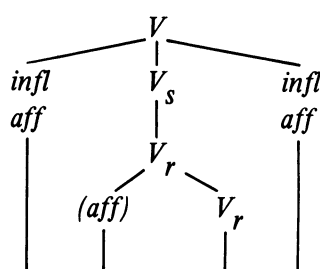
There is no obvious explanation offered by this formulation of the rule for *why* inflectional affixes immediately preceding derivational affixes delete – except that this is a descriptively adequate generalization. The more important claim is that unlike in German, *ge*-deletion is not a stress governed phenomenon in Dutch, but a purely morphological process. (There may be a possible explanation of why this rule is part of the language today from a diachronic point of view, if we consider the development of *ge*- from a derivational to an inflectional morpheme.)

In section 4 I will introduce the *problematic verbs*, which will be shown to be *subclasses* of regular complex verbs. These verbs will turn out to provide crucial evidence for the above formulated rule of *ge*-deletion and will lead to a slight reformulation of the rule. It follows from these verbs that for *ge*-deletion two environments are important:

*ge*- deletes in:



*ge*- does not delete in:



Thus, *ge*- deletes, if the verb STEM immediately dominates a derivational affix. If the verb ROOT dominates a derivational affix, *ge*- will not delete. Evidence will be given in sections 5 and 6 that the exact environment in which *ge*- deletes is the following:<sup>10</sup>

Rule of *ge*- deletion

$$\begin{bmatrix} \text{infl} \\ \text{aff} \end{bmatrix} \rightarrow \phi / \text{---} \begin{bmatrix} \text{deriv } X \\ \text{aff} \end{bmatrix}_{V_s}$$

#### 4. Problematic verbs

The verbs in question are problematic in the sense that speakers of Dutch do not have clear intuitions about what the *correct* inflectional forms are, there may be multiple, which may be equally plausible intuitively, or some may sound less likely or even impossible. In many cases speakers tend to *avoid* using finite forms, in main clauses, where Verb-second operates, as well as in subordinate clauses (see De Vries 1975, pp. 133, 148 and Schultink 1973, p. 413).

The data presented here is drawn mostly from De Vries. It is to be understood as a listing of forms found in dictionaries, supplemented by forms that are not in the dictionaries but that speakers have been noted to use (De Vries 1975, Schultink 1973), and some forms that are possible or acceptable in my judgement. However, the *crucial* point to be made about these verbs is that here the system as outlined in section 2 appears to collapse. Fortunately, it can be shown that except for a small class of verbs (see below) *all* these verbs differ from the regular complex verbs in a consistent way, which can be attributed to the effect of a *stress rule*. It requires some further explanation however, if it is the application of a rule in the grammar which creates problems for speakers, *why* there is a problem at all. In general it is not to be expected that the output of a rule in the grammar causes the system to collapse. The situation is obviously complicated.

An attempt to unravel some of the issues playing a role, besides what will be assumed to be going on in this section, will be done in section 9. An examination of the verbs in the table (cf. p. 172) reveals that the inflectional forms found are of three types, of which two have already been discussed in section 2, namely 1) prefixations, 2) *saamenkoppelingen* and also 3) reanalysed verbs (see section 5):

- |   |   |   |
|---|---|---|
| (1) <i>ónderwaardèerde</i><br><i>te ónderwaardèren</i><br><i>hèrwaardèerde</i><br><i>hèrwaardèerd</i> | (2) <i>verdèelde ónder</i><br><i>óndergewaardèerd</i><br><i>óver te verhitten</i> | (3) <i>gehèrwaardèerd</i><br><i>geónderwaardèerd</i><br>and possibly: <sup>12</sup><br><i>ónderwaardèerde</i><br><i>te ónderwaardèren</i><br><i>hèrwaardèerde</i><br><i>te hèrwaardèren</i> |
|---|---|---|

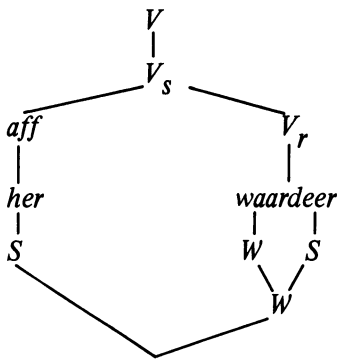
There is one feature that these verbs, except for the last two in the table have in common: the *nonverbal part carries the main stress* of the complex verb *and* the syllable following the first (in linear order) nonverbal part does *not* contain a major stress.

Given the distinct paradigms of section 2, and given that there exists evidence that in a number of these problematic verbs, the meaning of 'over' and 'onder' is that of the *prefixes* 'over-' and 'onder-',<sup>13</sup> an explanation of what the source of these verbs is and of their stress pattern is possible: apparently stress prominence is assigned to the nonverbal prefix in case the verb (root) has itself a W S prominence pattern. Otherwise the verbal part is prominent:

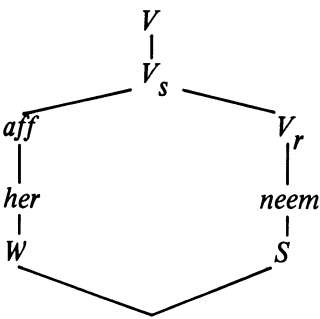


Table of examples of problematic verbs and their inflectional forms

Stress	Finite Forms	Past Participles	Infinitives
<i>óverwaardèren</i> (overestimate)	<i>overwaardeerde</i>	<i>overgewaardeerd</i>	<i>over te waarden</i> <i>te overwaarderen</i>
<i>óverkompensèren</i> (overcompensate)	<i>overkompenseerde</i>	<i>overgekompenseerd</i>	<i>over te compenseren</i> <i>te overkompenseren</i>
<i>ónderwaardèren</i> (underestimate)	<i>onderwaardeerde</i>	<i>ondergewaardeerd</i> <i>geonderwaardeerd</i>	<i>onder te waarden</i> <i>te onderwaarderen</i>
<i>óverfinancièren</i> (overfinance)	–	<i>overgefinancierd</i>	<i>te overfinancieren?</i>
<i>voórverkòpen</i> (pre-sell)	<i>voorverkocht</i>	<i>voorverkocht</i>	<i>voor te verkopen</i> <i>te voorverkopen?</i>
<i>voórvèrwarèmen</i> (preheat)	–	<i>voorverwarmd</i>	<i>voor te verwarmen</i>
<i>doórfournèren</i> (continue to put up money)	–	<i>doorgefournéerd</i>	<i>door te fourneren</i>
<i>hèrgroepèren</i> (regroup)	<i>hergroepeerde</i>	<i>hergroepeerd</i> <i>gehergroepeerd</i> <i>hergegroepeerd</i>	<i>te hergroeperen</i> <i>her te groeperen</i>
<i>hèrwaardèren</i> (re-evaluate)	<i>herwaardeerde</i>	<i>herwaardeerd</i> <i>geherwaardeerd</i>	<i>te herwaarderen</i> <i>her te waarden</i>
<i>hèraktivèren</i> (re-activate)	–	<i>geheractiveerd</i>	<i>te heraktiveren?</i>
<i>óververhittèn</i> (overheat)	<i>oververhitte</i>	<i>oververhit</i>	<i>te oververhitten</i> <i>over te verhitten?</i>
<i>ónderverdèlèn</i> (subdivide)	<i>onderverdeelde</i> <i>verdeelde onder</i>	<i>onderverdeeld</i>	<i>te onderverdelen</i> <i>onder te verdelen</i>
<i>hèrverdèlèn</i> (redistribute)	–	<i>herverdeeld</i>	<i>her te verdelen</i> <i>te herverdelen</i>
and: <sup>11</sup>			
<i>hèrùitzènden</i> (re-broadcast)	–	<i>heruitgezonden</i>	<i>her uit te zenden</i>
<i>hèrindèlèn</i> (regroup)	–	<i>heringedeeld</i> <i>geherindeeld</i>	<i>her in te delen</i>



but:



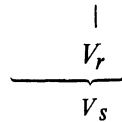
This is the result of the following

*Prefix Stress Rule:*  $\left[ \begin{smallmatrix} \text{deriv} \\ \text{aff} \end{smallmatrix} V_r \right]_{V_s} \rightarrow \hat{W} S$ , unless  $V_r$  itself is  $\hat{W} S$

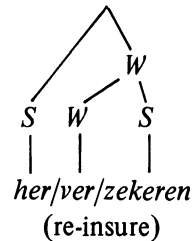
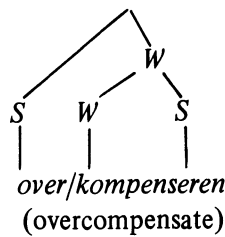
Or, more general:

*Prefix Stress Rule:*  $\left[ \begin{smallmatrix} \text{deriv} \\ \text{aff} \end{smallmatrix} X \right]_{V_s} \rightarrow \hat{W} S$ , unless  $X$  itself is  $\hat{W} S$ ,  
where  $X = V_r$  or  $V_s$

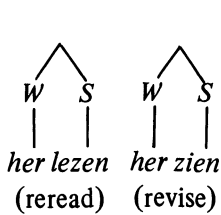
(*her/ver/zekeren* = re-insure)



This rule predicts that the prefix is prominent in:

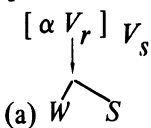


But not in:

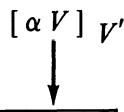


The output of this rule is a stress pattern that is *normally* that of *samenkoppelingen*. Given the strong correlation between stress and morphological structure (see section 2) and thus also inflectional forms, speakers of the language are faced with a conflict:

prefixation



samenkoppeling

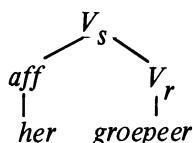


(b) if  $V_r$  is  $W S$ ,  $[\alpha V_r] V_s \rightarrow \boxed{S \quad W}$  (prefix stress)

Thus, the prefix stress rule *neutralizes*<sup>14</sup> the distinction between a prefixation and a *samenkoppeling* as far as stress pattern is concerned. Apparently, the relation between stress and morphological structure is so strong, that speakers vacillate in assigning these verbs a morphological analysis – which in turn is reflected in the existence of multiple inflectional forms.<sup>15</sup>

We can conclude therefore, that speakers have *multiple lexical entries* for these verbs, or at least one entry, with multiple morphological analyses associated with it. Based on each analysis, speakers have formed defective inflectional paradigms, constructed according to the rules associated with each morphological structure. For example, the verb '*hèrgroepèren*' (re-group) has *three* analyses associated with it:

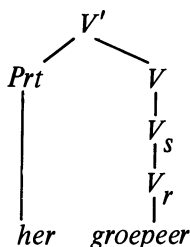
- (1) a prefixation:



plus inflectional forms:

*hèrgroepèerde*  
*hèrgroepèerd*  
*te hèrgroepèren*

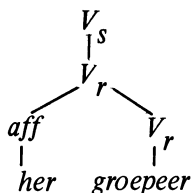
- (2) a *samenkoppeling*:



plus inflectional forms:

*hèrgegroepeerd*  
*her te groepeeren*

- (3) a reanalysed prefixation:



plus inflectional forms:

*gehèrgroepeerd* and possibly:  
*hèrgroepeerde*  
*te hèrgroepeeren*

(The past participle is the only instance in which the forms in 1) and 3) differ, namely in 1) *ge-* deletes but not in 3). However, since a form like '*hèrgroepèerd*' (1) is considered old-fashioned, possibly only 2) and 3) are still associated with '*hèrgroepèren*'.)

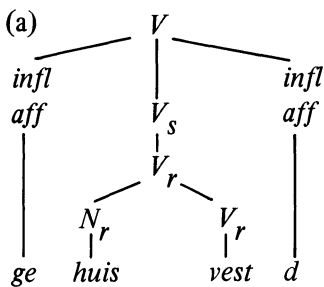
So far we have elaborated on two types of complex verbs, prefixations and *samenkoppelingen*, which we saw are associated with two types of past participles:

prefixations:  $[\phi \text{ } [ [\alpha]_{aff} [X]_{V_r} ]_{V_s} d]_V$   
 samenkoppelingen:  $[ [\alpha]_{Pr_t} [ge \text{ } [ [X]_{V_r} ]_{V_s} d]_V ]_{V''}$

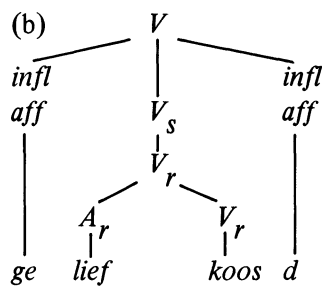
There is a third type of past participle, mentioned in the previous section, which is evidence for a third type of complex verb, namely of those verbs which have a complex *root*. The past participles are like the following (type 3 of section 4):<sup>16</sup>

- (a) *gehúisvèst* (housed)  
 (b) *geliefkoòsd* (caressed)  
 (c) *geónderwaardèerd* (underestimated)

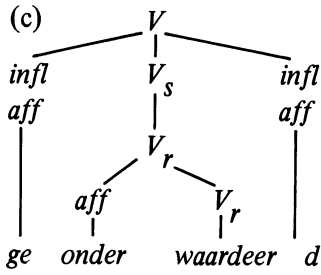
We can draw the following trees for the past participles of these verbs. Inflectional *ge-* does *not* delete (following the rule), since the verb *stems* do not immediately dominate a derivational prefix:



*gehuisvest*



*geliefkoosd*



geonderwaardeerd

Two facts in support of this structure (diachronically: reanalysis to *root* which means that synchronically these structures are *available*) are:

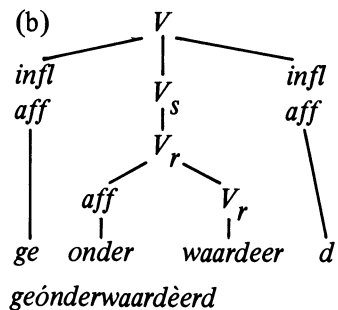
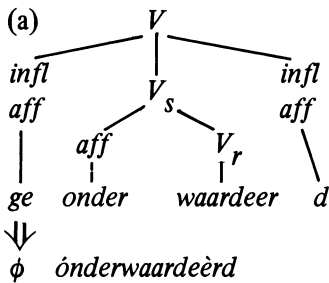
(1) This gives the right result for the past participle deletion rule. It predicts a contrast between:

(a) [ [onder]<sub>aff</sub> [waardeer]<sub>V<sub>r</sub></sub> ]<sub>V<sub>s</sub></sub> and

(b) [ [onder]<sub>aff</sub> [waardeer]<sub>V<sub>r</sub></sub> ]<sub>V<sub>r</sub></sub>

as far as the past participles are concerned, namely in a) *ge-* deletes ('*ónderwaardeerd*') but in b) *ge-* does not delete ('*geónderwaardeerd*'), and indeed both forms have been found. (Although neither sounds too good,<sup>18</sup> as already mentioned about these verbs in section 4.)

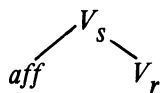
In tree:



(2) It can be no accident that whenever reanalysis has taken place (as evidenced in particular by the past participles), the input has a S W stress pattern. Therefore we may assume that reanalysis can only take place if the input has a S W relationship. Not all S W configurations reanalyse: N + V and A + V *samenkoppelingen* do, but most *Prt + V samenkoppelingen* do not, because they are productive (see also below at the end of

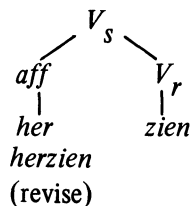
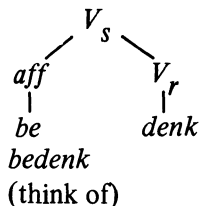
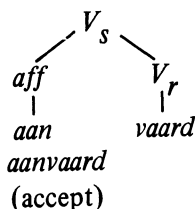
section 8); moreover those prefixations which have a  $\hat{S}W$  prominence pattern do.

If the input does *not* have a  $\hat{S}W$  prominence pattern, reanalysis apparently does not take place. This situation only obtains for prefixations, i.e. verbs of the form



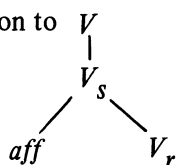
in which the normal stress pattern is  $\hat{W}S$ .

Examples are

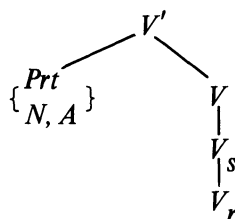


So – for example – ‘*herzién*’ cannot reanalyse, and therefore \*‘*geherzién*’ is out, as well as \*‘*geaanvaard*’ and \*‘*gebedácht*’, since the verb *stem* dominates a derivational affix.<sup>19</sup>

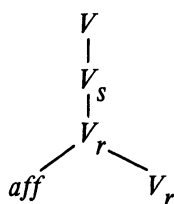
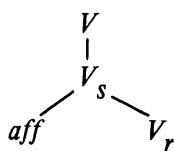
Thus, in addition to



and

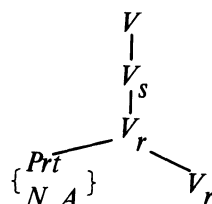
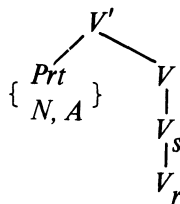


structures for complex verbs, speakers also have available for the analysis of the data the *structure* or *reanalysed* complex verbs, those verbs that have an  $\hat{S}W$  prominence pattern (prefixations and *samenkoppelingen*):



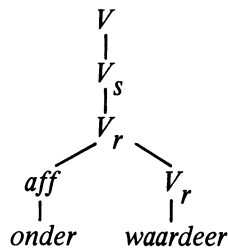
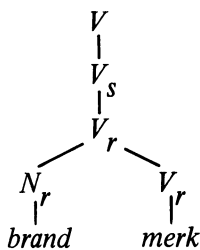
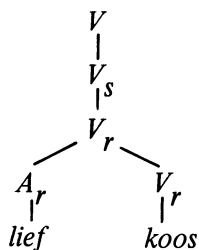
prefixations

and

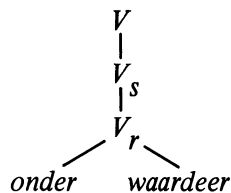
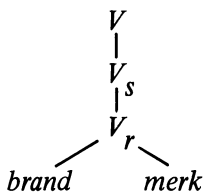
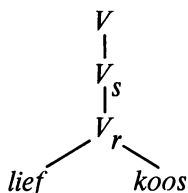


*samenkoppelingen*

Examples:

*liëfkòzen*  
(caress)*brándmèrken*  
(stigmatize)*ònderwaardèren*  
(underestimate)

Or possibly:

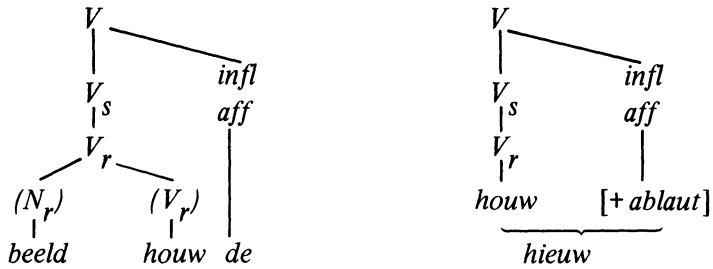


to capture the fact that the  $N_r$  and  $A_r$  have completely lost their status as a  $N$  or  $A$  syntactically and have formed a complex verb *root*.

This is also illustrated by the following facts. Consider the verbs ‘*beëldhòuwen*’ (sculpture) and ‘*stófzùigen*’ (vacuum clean). The verbs ‘*hòuwen*’ (cut) and ‘*zùigen*’ (suck) have a *strong* inflectional pattern:

*hòuwen* – *hieuw* – *gehòuwen*  
*zùigen* – *zóog* – *gezógen*  
           (past)       (past participle)

But the verbs ‘*beëldhòuwen*’ and ‘*stófzùigen*’ have a *weak* inflectional pattern (i.e. they form the past by adding a suffix *-de(n)*, the past participle by prefixing *ge-* and suffixing *-d*, which is the way all ‘new’ verbs are inflected in modern Dutch). This suggests that it is the *root* ‘*beëldhòuw*’ and the *root* ‘*stófzùig*’ which are being inflected according to the rules that produce weak inflectional forms, and not the ‘old’ roots ‘*hòuw*’ and ‘*zùig*’ which are inflected according to principles that are no longer part of the grammar of Dutch and thus have to be learned as exceptions:



Two issues involving this analysis of complex verbs have to be addressed:

- (a) What is the status of the condition on reanalysis? Is there an explanation why only verbs with an  $\hat{S}W$  prominence pattern can undergo reanalysis?
- (b) From this description of what the source is of complex verbs like 'brándmèrken' (stigmatize), 'húisvèsten' (lodge), 'liéfkòzen' (caress) etc, follows that there may be earlier stages of the language in which these sources are attested.

However, it is clear that we cannot draw any definite conclusions about earlier stages of the language by looking at a set of rules that are supposed to be underlying the data in present day Dutch, since they are the rules that the child will formulate, based on evidence from present day Dutch. So, the rules the child will come up with may bear no evidence of an evolution the language has undergone. Even stronger, considering diachronic evidence may lead one to postulate an explanation of the state of affairs *now* that may be historically accurate, but that is not an adequate account of what it is the child has to learn in order to speak the language 'properly'.

What will lead the child to assume that only verbs with a  $\hat{S}W$  prominence pattern can be assigned the structure of a complex root? The explanation has to be found in the data s/he is presented with. If we scrutinize the verbs in Dutch, it is obvious that most simple verbs are stress initial (have the main stress initially) and that relatively few verbs deviate from this pattern. Of course, the majority of *simple* verb roots is monosyllabic anyway.

Examples are:

	$\hat{S}W$	$\hat{W}S$
monosyllabic roots	polysyllabic roots	polysyllabic roots
kijk, blijf, zien	kákel, hándel	bakkeléi, benedij



(look) (stay) (see)	(chatter) (negotiate)	(scuffle) (bless)
<i>gaán, lég, hélp</i>	<i>wéiger, húnker</i>	<i>krakéel, trompétter</i>
(go) (lay) (help)	(refuse) (crave)	(quarrel) (play the trumpet)
<i>stáan, dénk, sláap</i>	<i>árbeid, kápseis</i>	<i>bordúur, schermútsel</i>
(stand) (think) (sleep)	(labor) (capsize)	(embroider) (skirmish)
<i>wíl, gáap, zét</i>	<i>wánhoop, zánik</i>	<i>kamenier</i>
(want) (yawn) (put)	(despair) (nag)	(be a lady's maid)
etc.	etc.	and all verbs on - <i>éer</i> :
		<i>halvéer, studéer</i> , etc.
		(bisect) (study)

So we may conclude that based on the stress pattern of the majority of *simple* verbs in Dutch, there exists a strong tendency towards *root initial stress*. This may be part of an *abstract model* for the generation of *native* (Germanic) verb roots. In other words, the typical verb root in Dutch is stress initial.

This 'constraint' may be regarded to be one of the same nature as constraints for example on possible syllable initial consonant clusters in Dutch words: \*FTR and \*GTP but STR and SPR. Thus it can be regarded as a wellformedness condition on verb roots in general.

#### 6. Evidence for the past participle prefix *ge*-deletion rule and the constraint on imposing a complex root analysis

Schultink's (1973) account of the *ge*-deletion process is based on sensitivity of the rule to both stress and the presence of prefixes. He postulates the following rule (adapted from a Kiparskyan notation but essentially the same):

$$(8) \quad ge \rightarrow \phi / \text{---} \left( \left[ \begin{array}{c} \text{prefix} \\ + \text{stress} \end{array} \right] \# \right) \left[ \begin{array}{c} \text{prefix} \\ - \text{stress} \end{array} \right] \# X \Big]_V$$

In words: inflectional *ge*- is deleted before an unaccented (should be not primary stressed)<sup>21</sup> prefix, that may itself optionally be preceded by a stressed prefix. So there are two environments in which the rule applies:

- (1)  $\text{---} \left[ \begin{array}{c} \text{prefix} \\ + \text{stress} \end{array} \right] \# \left[ \begin{array}{c} \text{prefix} \\ - \text{stress} \end{array} \right] \# X \Big]_V$  and
- (2)  $\text{---} \left[ \begin{array}{c} \text{prefix} \\ - \text{stress} \end{array} \right] \# X \Big]_V$

(1) *ge* [*her # be # wapend*]<sub>V</sub>    *φ* [*her # be # wapend*]<sub>V</sub>

(2)  $ge [ be \# waard ]_V \quad \phi [ be \# waard ]_V$

$$- \begin{bmatrix} \text{prefix} \\ + \text{stress} \end{bmatrix} \# \begin{bmatrix} \text{prefix} \\ - \text{stress} \end{bmatrix} \# X \bigg]_V,$$

*ignore* a prefix that is stressed (actually that prefix will always carry a 1 stress), *if it is followed by an unstressed prefix*. When this stressed prefix is *not* followed by an (unstressed) prefix, the rule of *ge*-deletion will not apply. For example:  $\phi[hér\#be\#wàpend]_V$ , but: *ge* $[hér\#waardeèrd]_V$ .

The situation is less straightforward than this though, since we also find  $\phi[\text{hér\#waardeêrd}]_V$  (although this form is considered old-fashioned). So we observe that *ge-* may or may not delete before a *single* (one) stressed prefix, but *must* delete before a (one) stressed prefix *if it is followed by an unstressed prefix*. According to Schultink, it is the presence of this *unstressed* prefix which causes *ge-* to delete.

This leads me to believe that rule (8) cannot be the correct characterization of the environment in which *ge-* deletes. The crucial examples are:

- (a) *ge*-deletion *must* apply: *hér / be / wàpend* \**ge / hér / be / wàpend*  
(rearmed)  
*ónder / ver / hùurd* \**ge / ónder / ver / hùurd*  
(sublet)  
*óver / ver / hit* \**ge / óver / ver / hit*  
(overheated)

- (b) *ge*-deletion may or may not apply (although deleting *ge*- produces forms that are considered somewhat old-fashioned so the tendency appears to be towards not applying the rule):

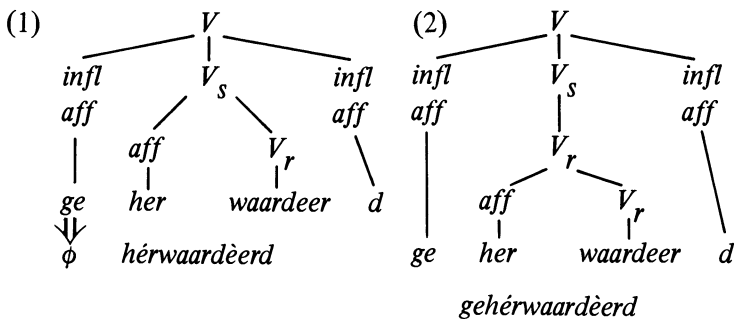
*ge / hér / waardèerd*    *hér / waardèerd*  
(re-evaluated)  
*ge / ónder / waardèerd*  
(underestimated)  
*ge / hér / groepèerd*    *hér / groepèerd*  
(regrouped)

(So, in Schultink's terminology, *ge*-deletion, from being an either/or phenomenon, i.e. *ge*- deletes before an unstressed prefix, is becoming a 'both prefix and unstressed' phenomenon.)

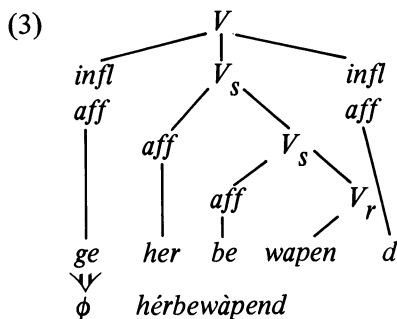
Note that in the above formulation of the rule, it is the presence of the *unstressed* prefix that immediately precedes the verb root that causes *ge*-to delete. We have to *ignore* in that case the second, primary stressed prefix. This I would say is a rather ad hoc way to make the rule work, which makes it moreover look less likely that it is a stress based phenomenon in the first place.

The rule at the end of section 3, plus the condition on imposing a complex root analysis, *predicts* that we find (in the history of the language) *both* '*hérwaardéerd*' and '*gehérwaardéerd*' for example, but *only* '*hébewàpend*' and *never* \*'*gehébewàpend*'.

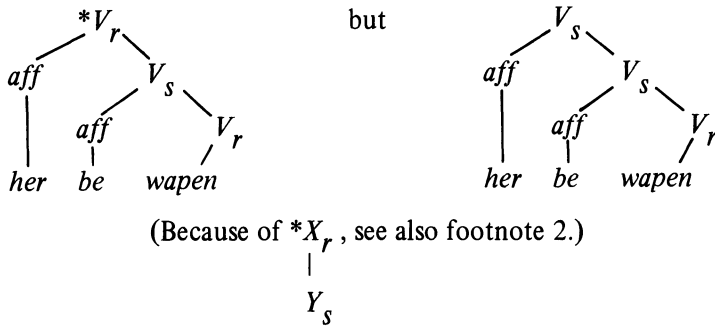
The following situations obtain namely:



(Since  $V_s$  immediately dominates (Which appears to be the preferred form so analysis 2) has replaced analysis 1).)



For '*hébewàpenen*', analysis as complex root cannot be imposed, since '*bewàpenen*' has a W S prominence pattern. So, for '*bewàpenen*', analysis as complex root cannot be made, and hence this analysis is also impossible for '*hébewàpenen*':



Of course, I am not claiming that *this* is the crucial evidence which makes the language learner decide that it is the presence of a derivational prefix only which triggers *ge*-deletion. What I do claim is that this data provides us with crucial evidence that it is the presence of a derivational prefix rather than stress, which is the relevant environment for the rule. This data merely confirms that that is so. Stress does play an important role, but only with respect to the choice of analysis that can be imposed on a complex verb.

Moreover, given a system in which derivational prefixes *and* stress are assumed to be factors that govern the rule of *ge*-deletion, a special amendment to the rule has to be made, which says in effect 'ignore a stressed prefix' in a particular environment, while at the same time the claim is made that for all other environments, it is stress *and* prefix status which are crucial.

There are two additional pieces of evidence in favor of the rule as proposed in section 3, plus the account of when analysis as complex root can be imposed:

- (1) On p. 415 Schultink mentions the following past participles, which have a 1 stress on the prefix *ont*-:

<i>geóntmythologisèerd</i>	(de-mythologized)
<i>geóntaromatisèerd</i>	(de-aromatized)
<i>geóntindividualisèerd</i>	(de-individualized)

Normally, *ont*- is an unstressed prefix, like *be*-, *ge*- or possibly carries secondary stress, like  $v^2r$ - ( $|ver|$ ) (before a non-prominent vowel, see also footnote 4). Apparently, for some speakers of Dutch, *ont*- can receive a major stress by the prefix stress rule, unlike  $v^2r$ - ('blocked' by the existence of the adverb *ver* ( $|v^2r|$  = 'far'), which carries the major stress of the phrase):

e.g.	<i>vérspringen</i> (long jump) enters the verbal system via <i>backformation</i> from the noun <i>vérspringen</i>	versus	<i>verspringen</i> (shift, sprain) <i>prefixation</i>
------	---	--------	---

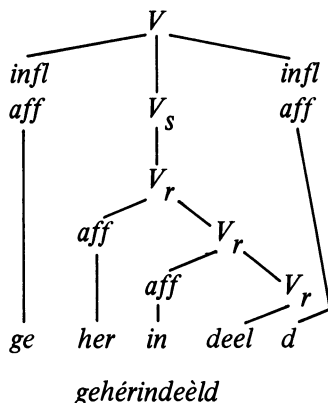
Also in:

<i>véргеzicht</i>	(litt. far-view = panorama)
<i>véргеzocht</i>	(far-fetched)
<i>véргеvòrderd</i>	(far-advanced)
<i>vérrèikend</i>	(far-reaching)

This implies that for those speakers, analysis as complex root can be imposed ( $\hat{S}W$  structures) as is evidenced by the fact that *ge-* does not delete in '*geóntmythologiseèrd*' etc.

(2) De Vries on p. 136 (taken from the dictionary Van Dale) mentions besides '*héringedeèld*', which one would expect, since '*índelen*' is a *samenkoppeling*, also the peculiar '*gehérindeèld*', which he explains as a possible backformation from the noun '*héringdeling*' (reclassification).

However, given that in '*índelen*' the relative prominence is  $\hat{S}W$ , analysis as complex root can take place, and since '*héringdelen*' also has an  $\hat{S}W$  pattern, analysis as complex root again can be imposed, resulting in the following structure:



### 7. Comparison of the German process of *ge*-deletion and the Dutch version

As had already been argued by a.o. Kiparsky (1966), the rule of *ge*-dele-

tion in German is at least in part stress governed, since *simple* roots that do not have a major stress on the first syllable trigger *ge*-deletion (see also Kiparsky 1966, p. 70):

<i>studiért</i>	* <i>gestudiért</i>
<i>stibítzt</i>	* <i>gestibítzt</i>
<i>schlampámp</i>	* <i>geschlampámp</i>
<i>trompétet</i>	* <i>getrompétet</i>

Kiparsky's rule is the following

$$B\ 1' \left\{ \begin{matrix} ge \\ be \end{matrix} \right\} \rightarrow \phi / \# \# \text{ --- } \# C_O \left[ \begin{matrix} \text{Vowel} \\ \text{--- Stress} \end{matrix} \right] X \Big]_V$$

Whether this rule governs all aspects of *ge*-deletion remains to be seen. In this paper I will only address the question of what the relevant conditions are for Dutch and in which way the data differs from German.

In Dutch, *ge*- does *not* delete before a simple stem (or at least one that does not contain derivational *prefixes*), no matter what the stress pattern of the stem is:

<i>gestudéerd</i>	* <i>studéerd</i>	(studied)
<i>gehalvéerd</i>	* <i>halvéerd</i>	(bisected)
<i>gekastíjd</i>	* <i>kastíjd</i>	(chastised)
<i>geráakt</i>	* <i>ráakt</i>	(hit)

Moreover, there is an interesting difference in the formation of complex verbs. Kiparsky mentions for example (p. 70) both '*lièbkòst*' and '*gelièbkòst*'.<sup>21</sup> However note the stress patterns: '*lièbkòst*' versus '*gelièbkòst*'. In other words, in German *ge*- deletes before a non primary stressed vowel, whether that vowel is part of the stem (*studiért*), a prefix (*misbráucht*, *verkáuft*) or any other element that participates in complex verb formation (N, A: *lièbkòst*).

From a diachronic point of view, it is not unlikely that *ge*- deletion in Dutch may have been an (in part) stress-based phenomenon too. What I am concerned with in this paper, however, is to describe systematically how the language learner will incorporate these phenomena in his/her grammar. For him/her, *ge*-deletion in Dutch is *not* a stress based phenomenon.<sup>22</sup> The only instances in which we see this hypothesis positively confirmed, and an earlier account based on stress disproved, is exactly the problematic verbs of section 4, which fortunately allow us a 'peek' into the 'kitchen' of Dutch grammar.

## 8. Is there such a category of verbs as 'samenkoppelingen'?

The question is, whether the so called 'samenkoppelingen' are products of a special rule, and are dominated by a 'special' node  $V'$ :

$$V' \rightarrow \begin{Bmatrix} \text{Prt} \\ N \\ A \end{Bmatrix} V$$

Alternatively,  $\text{Prt} + V$ ,  $N + V$  and  $A + V$  may be products of the normal phase structure rules, in which case there is no separate category dominating them. A special transformational rule of incorporation then has to account for their syntactic behavior. This route is proposed in Van Riemsdijk 1977. He generates particles as intransitive prepositions, claiming that no new phrase structure rule is needed. However, to account for the fact that  $\text{Prt} + V$  (and  $A + V$  and  $N + V$  as well) can appear in infinitival sequences, where normally only a verb can appear, he postulates a Particle Incorporation rule (which he notes has to be generalized to include adjectives and nouns as well):

(139) *Particle Incorporation*

X	—	P	—	V	—	Y
1		2		3		4
1		$\phi$		2+3		4

Examples are (in the (b) sentences Incorporation has applied);

- (a) *omdat hij zijn broer op had willen bellen*  
(because he his brother up had wanted call =  
because he had wanted to call up his brother)
- (b) *omdat hij zijn broer had willen opbellen*  
(because he his brother had wanted up call =  
because he had wanted to call up his brother)
- (a) *omdat hij stand had willen houden*  
(because he firm had wanted stand =  
because he had wanted to stand firm)
- (b) *omdat hij had willen standhouden*  
because he had wanted firm stand =  
because he had wanted to stand firm)

- (a) *omdat hij het goed had moeten keuren*  
(because he it fit had should think =  
because he should have thought it fit)
- (b) *omdat hij het had moeten goedkeuren*  
(because he it had should fit think =  
because he should have thought it fit)

This transformation is optional on subordinate clauses, it may or may not apply in producing the (a) or (b) sentences; yet Incorporation may *not* apply in *root* clauses, since Prt, A or N can *not* be fronted by Verb-second:

- |  |  |
|--|--|
| (a) <i>*hij opbelde zijn broer</i><br>(he up called his brother) | (b) <i>hij belde zijn broer op</i><br>(he called his brother up) |
| (a) <i>*hij goedkeurde het</i><br>(he fit thought it)            | (b) <i>hij keurde het goed</i><br>(he thought it fit)            |
| (a) <i>*hij standhield</i><br>(he firm stood)                    | (b) <i>hij hield stand</i><br>(he stood firm)                    |

There are certain verbs with A or N that front as a whole, but these have to be considered reanalysed in the lexicon, since they *never* separate:

- (a) *hij liefkoosde zijn nieuwe brommer*  
(he caressed his new moped)
- (b) *\*hij koosde zijn nieuwe brommer lief*
- (a) *hij handhaafde de orde*  
(he maintained the order)
- (b) *\*hij haafde de orde hand*

Their paradigms are consistent:

past part:	<i>geliéfkòosd</i>	<i>* liéfkòosd</i>
infinitive:	<i>te liéfkòzen</i>	<i>* lief te kòzen</i>
finite:	<i>liéfkòosde</i>	<i>* kòosde – liéf</i>
past part:	<i>gchándhàafd</i>	<i>* hándhàafd</i>
infinitive:	<i>te hándhàven</i>	<i>* hand te hàven</i>
finite:	<i>hándhàafde</i>	<i>* hàafde – hând</i>

Alternatively, I assume, based on the properties of this construction, that there is a rule:



$$V' \rightarrow \begin{Bmatrix} \text{Prt} \\ N \\ A \end{Bmatrix} V$$

$V'$  is a special category in that transformations can either apply to  $V'$  or  $V$ . Verb-second will have to be formulated in such a way that it operates on  $V$  only, since the nonverbal part is invariably left behind:

- (a) *Jan nam het werk over*  
(John took the work over =  
John took over the work)
- (b) \**Jan overnam het werk*  
(John over took the work)

Analysis as a complex root, as we have seen, applies primarily if not exclusively to *samenkoppelingen* of the type  $N + V$  and  $A + V$ , not to the type  $\text{Prt} + V$  (because most are productive according to De Vries). So we find:

<i>liéfkòzen</i> (caress)	pp <i>geliefkoosd</i>	But: <i>indèlen</i> (classify)	pp <i>ingedeeld</i>
<i>waárbòrgen</i> (guarantee)	pp <i>gewaARBorgd</i>	<i>vóordòen</i> (pretend)	pp <i>voorgedaan</i>
<i>hándhàven</i> (maintain)	pp <i>gehandhaafd</i>	<i>méegeven</i> (give in)	pp <i>meegegeven</i>
<i>brándmèrken</i> (stigmatize)	pp <i>gebrandmerkt</i>	<i>úitlòpen</i> (sprout)	pp <i>uitgelopen</i>

This view of the origin of verbs like '*liéfkòzen*', etc. entails that the direction of development of these complex verbs is from separable towards unseparable lexical units. Thus we may expect to find a stage in the language in which there is a separable  $N + V$  or  $A + V$  *samenkoppeling* '*liéfkòzen*', '*waárbòrgen*', etc.

The main arguments for assuming that *samenkoppelingen* are generated by a special rule are the following:

- (A) *Samenkoppelingen* can appear at the end of a sequence of (raised) infinitives, where otherwise only verbs can appear. No other products of the phrase structure rules that have the same form as *samenkoppelingen* but are not syntactic constituents, can appear there:

- (a) *\*omdat Jan had willen Frans leren*  
(because John had wanted French learn)
- (b) *omdat Jan Frans had willen leren*  
(because John French had wanted learn =  
because John had wanted to learn French)

Thus, '*Frans leren*' (learn French) is *not* a *samenkoppeling*. Compare this with:

- (a) *omdat Jan had willen opbellen*  
(because John had wanted up call =  
because John had wanted to call up)
- (b) *omdat Jan op had willen bellen*  
(because John up had wanted call =  
because John had wanted to call up)

(B) *Samenkoppelingen* can be used in '*aan het* + infinitive' constructions (see Koster 1975), the Dutch equivalent of the English progressive:

- (a) *Jan is aan het afwassen*                      (b) *\*Jan is af aan het wassen*  
(John is doing the dishes)
- (a) *\*Jan is aan het Duits leren*              (b) *Jan is Duits aan het leren*  
(John is learning German)

So there exist two *syntactic* tests for determining whether a *Prt + V*, *N + V* or *A + V* sequence is a *samenkoppeling* or not.

(C) Many *samenkoppelingen* have entered the lexicon and have undergone semantic drift, so that often besides a purely compositional *samenkoppeling*, a non-compositional *samenkoppeling* occurs. De Vries (p. 78) has tried to determine which particles are productive, and which particles have to be considered non-productive. That in itself explains why so few *samenkoppelingen* are reanalysed – according to Dr Vries, most particles are productive.

#### 9. Some speculations about why there are problematic complex verbs at all in Dutch

It is quite possible that some speakers opt consistently for a particular analysis of the complex verbs of section 4, i.e. show preference for

analysing them consistently as prefixations or as *samenkoppelingen*. However, since the traditional dictionaries (Van Dale, Kramer, Koenen Endepols) do not agree on inflectional forms, or do not even enter certain finite forms (avoiding the whole issue), this is a good indication that matters have not been settled (yet?).

The question arises, why there is a problem at all, if the source of the confusion is, as we have claimed, a stress rule of a rather uncontroversial nature. A stress rule however, that apparently neutralizes an important distinction.

In any attempt to formulate a (synchronic) grammar in the sort of instantaneous, idealized manner that transformational grammarians presuppose, what is captured is only a 'moment' in the history of the language. *Ge-*deletion is a process independent of, but 'fed' by, the output of the prefix stress rule. The set of problematic verbs is only a small part of the total verbal system. Of the 'prefixes' involved, 4 out of 5 have a different meaning when used in a prefixation from when used in a *samenkoppeling*. Only *her* does not involve a clash in meaning between a prefix and a homophonous particle.

The real question is what the diachronic picture is, given that a stress rule creates structures that are morphologically opaque. Is this stress rule relatively new in the grammar, or has its potential input increased by independent factors in the grammar? What is the language learner likely to do (if anything) to disambiguate the analysis of these verbs, given the direction (if any) that any change so far has taken? These verbs are not part of the 'core' grammar of the language, so either the language learner has to rely on the system of rules for the regular classes of complex verbs, or possibly s/he simply has to *learn* what the preferred (or correct) inflectional forms are. A certain amount of creativity however is possible and dictionaries which to some extent represent the *prescriptive* aspects of grammars, tend to avoid the issue or simply *list* possible forms.

There are additional factors which could very well complicate matters to the extent that a uniform treatment of the problematic verbs is not possible (in combination with a stress rule which produces patterns which are normally associated only with *samenkoppelingen*). It is clear that the stress pattern plays an important role in the interpretations of morphological structure.

Although the problematic verbs fall for the most part into a subclass of prefixations, namely those in which the syllable following the prefix is not prominent, there is probably *no single source* for all of these verbs:

It is obvious that the unseparable prefix '*her-*' has acquired the status of

an independently occurring particle 'her' (a free morpheme), as evidenced by:

*herlézen* – *herlás* – *herlézen* – *te herlézen*  
(reread)

but:

*hérwaardèren* – *hérwaardeerde* – *hégewaardeerd* – *hér te waardèren*  
(reevaluate)

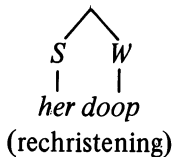
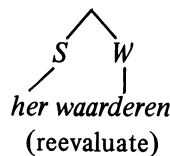
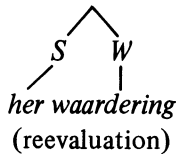
(Also possible is that two morphemes 'her' are involved which have merged.)

The so-called problematic verbs are limited to a few prefixes:

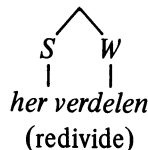
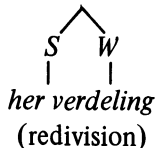
- |                |                 |                  |                 |                 |
|----------------|-----------------|------------------|-----------------|-----------------|
| (1) <i>her</i> | (2) <i>over</i> | (3) <i>onder</i> | (4) <i>voor</i> | (5) <i>door</i> |
| (re)           | (over)          | (under)          | (pre)           | (keep on V-ing) |

Of these prefixes, as already mentioned, 'her' may add complications because of its changing status (morphologically).

*Backformation* may also be a source for some of these verbs. For *her*, De Vries (p. 133) mentions an observation made by Van Haeringen (1962), who points out that new formations with *her* ending in *-ing* and *-atie* (nouns!) are more frequent than the corresponding verbs. The noun has a prominent prefix at all times, the verb *only* if the syllable following the prefix is not prominent:



but:



There is also the following verb: *hérkaiuwen* (ruminate),<sup>23</sup> which cannot have received its stress pattern by the prefix stress rule, since the root

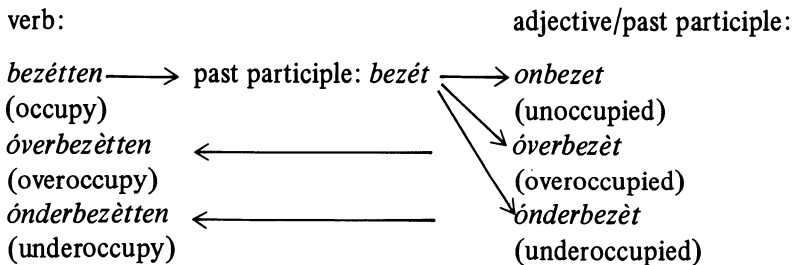
[*kauw*]<sub>Y</sub>, will have the main stress on its first (and only) syllable. So therefore, the only plausible explanation for this stress pattern is that this verb is a *backformation* from the noun '*hérkauwer*' (ruminant). Inflectional forms: *hérkauwde* – *gehérkauwd* – *te hérékauwen* (i.e. of a complex root).

Thus by analogy some of the verbs prefixed with prominent *her* may have been derived by backformation from nouns.

Backformations themselves are 'problematic', in that they have to be 'fitted' into the system of complex verbs in order to be properly inflected. The only ways in which they can be fitted in are as 1) prefixations, 2) *saamenkoppelingen*, or 3) complex roots.

If attention is paid to the *stress* pattern of the backformation, it will be most likely assigned the morphological structure of a *saamenkoppeling* and be inflected as such; if attention is paid to the morphological structure of the noun from which the verb is derived, the tendency may be to analyse it as a prefixation and inflect it as such.

For verbs with '*over*' and '*onder*' backformation may play a role in the following way:



Thus, past participles may be prefixed by *on-*, *over-* and *onder-* to produce forms that usually have the status of an adjective. In the case of an adjective prefixed by *on-* verb formation is not possible. (The verbal negative prefix is *ont-*.) For adjectives prefixed by *over-* and *onder-*, verb formation *is* possible. (Probably because there exist a verbal prefix *over-* and a verbal prefix *onder-* which produce regular complex verbs.)

There is no way of determining how great the influence of the above factors is in analysing complex verbs, but it may serve as an indication of why these problematic verbs arose at all, the problem being essentially to determine which analysis is the appropriate one, given the rules and forms available. The variety of inflectional forms which these verbs exhibit, and the uncertainty as to which are correct, are a reflection of the complexity of the factors involved in establishing what the 'correct' morphological analysis is.

## Notes

<sup>1</sup> Samenkoppelingen are verbs 'coupled' with what have traditionally been called 'separable prefixes', i.e. particles, but also nouns and adjectives. De Vries (1975) cites Overdiep & Van Es (1949, *Stilistische grammatica van het moderne Nederlands*), who call the same lexical entry a *samenkoppeling* in an infinitive without marker 'te' (to), like in '*aankòmen*' (arrive, touch), but a *word group* in finite forms like '*kwàm -aán*' (as in main clauses where Verb-second operates – see Appendix).

Normally the nonverbal and verbal part of *samenkoppelingen* are written as one word: '*aankòmen*', '*aangekòmen*', etc., versus '*kwáad wòrden*', '*kwáad gewòrden*', etc. (get mad), which is *not* a *samenkoppeling*. Though this may be a purely conventional matter, it lends at least some plausibility to the otherwise misleading name of (separable) '*prefixes*'.

It will be seen that the morphological structures of prefixed verbs and *samenkoppelingen* are totally different, and that in the latter case no *prefixes* are involved.

The word '*samenkoppelingen*' has no direct analogue in English. A subclass of *samenkoppelingen*, namely verb-particle constructions, can be compared with the English verb-particle construction. However, the class of *samenkoppelingen* is broader, including noun + verb and adjective + verb constructions. Justification for including these in the class of *samenkoppelingen* is their semantic and syntactic behavior (see also section 8).

<sup>2</sup> The internal structures I am assuming for complex verbs are based on the theory as outlined in Selkirk (to appear). Note that there is a special category 'affix' which comprises both inflectional and derivational affixes.

The lexical categories (words) are claimed to be made up of a stem plus inflectional affixes. Stems in turn may be composed of derivational affixes plus stems or roots.

The distributional properties of the affix classes (neutral versus nonneutral) follow from their status as root adjuncts versus stem adjuncts, rather than the particular *boundary* that is associated with each individual affix, as in traditional accounts of affix classes (SPE, Aronoff, Siegel). In this paper boundaries play no role other than that they appear in previously proposed formulations of the rules involved.

The rewriting rules posited for generating complex verbs in Dutch in this paper differ from the rules Selkirk gives for the derivational morphology of English. More study of the lexical structure of words in Dutch is needed to be able to determine whether claims embodied in Selkirk's rules hold for Dutch as well.

One aspect of those rules I have incorporated into my account of Dutch complex verbs, namely the condition:

$$\begin{array}{c} *X_r \\ | \\ Y_s \end{array}$$

I.e. *roots* do not dominate *stems*, only *roots*.

Also – derivational affixes are never sisters to each other, but each affix introduces a new level of morphological structure:

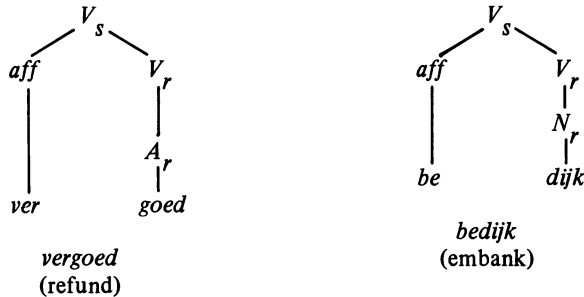
$$\begin{array}{c} *X_s \\ / \quad \backslash \\ \text{deriv} \quad \text{deriv} \\ \text{aff} \quad \text{aff} \end{array} \quad Y_{s/r}$$

but

$$\begin{array}{c} X_s \\ / \quad \backslash \\ \text{deriv} \quad Y_{s/r} \\ \text{aff} \quad / \quad \backslash \\ \text{deriv} \quad Z_r \\ \text{aff} \end{array}$$

Much detail has been left out in the analyses in this paper, only those details relevant for the issues involved and the arguments made have been included.

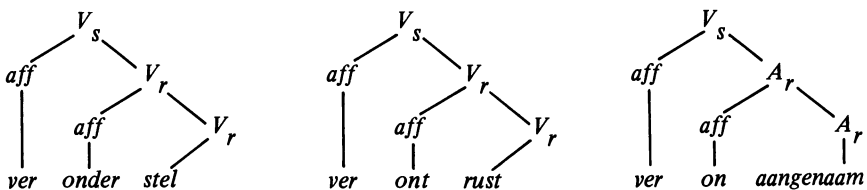
<sup>3</sup> This is a very productive process. I am assuming that their internal structure is the following:



<sup>4</sup> If we try to characterize the nonneutral derivational affixes more precisely in terms of structure, it is clear that they are *root* adjuncts. This explains why there are so few doubly prefixed verbs in Dutch. *Root* adjuncts would have to combine with *stems*, unless reanalysis or analysis as complex root can be imposed (see section 5). There are a few exceptions:

<i>veronderstellen</i>	(suppose)
<i>verontrústen</i>	(worry)
<i>verontschuldigen</i>	(excuse)
<i>veronthéiligen</i>	(desecrate)
<i>verontréinigen</i>	(pollute)
<i>veronaángenamen</i>	(make miserable)
<i>veronáchtzamen</i>	(neglect)

We have either to assume that occasionally a root adjunct can function as a stem adjunct, or that 'onderstel', 'ontrust', etc. are roots. Since there are no verbs (and thus *stems*) of the form 'onderstellen', 'ontrústen', etc., i.e. the forms *without* the prefix *ver-*, I assume they have the following structure:



(*ont-* is a verbal prefix, *on-* is an adjectival prefix).

The prefix *ver-* in these verbs can be unstressed ( $[v\partial r]$ ), or has secondary stress ( $[v\partial r]$ ), presumably due to the non-prominent vowel following. See further section 6, for why *ver-* never receives the major stress of the phrase. Thus these verbs are either exceptions to the root adjunct status of the prefix *ver-*, or to the condition on reanalysis of section 5.

<sup>5</sup> This makes one appreciate the ease of survey that an SPE type representation offers! However I owe the insight to Lisa Selkirk that it is the hierarchical arrangement of the elements involved which is the relevant factor in the workings of the phonological rules, rather than the nature or type of boundary that is supposedly associated with the different classes of affixes. For example, assume that root adjuncts

are separated by a # boundary from the root, elements in the root by at most a + boundary (or nothing). Then in order to capture the fact that *samenkoppelingen* do not behave like stems or roots, we would be forced to introduce a new type of boundary (# # may be). This would *obscure* completely that it is not the type of boundary which determines what rules of the grammar will apply and to what effect, but the hierarchical nature in which material is arranged into complex structures.

<sup>6</sup> So the question whether *ge*-deletion is a stress based phenomenon will not even arise for the child that is trying to figure out the rules for Dutch – the only instances *s/he* is presented with in which *ge*- deletes are prefixed verbs, so quite naturally *s/he* will associate derivational prefixes with the environment for *ge*-deletion.

<sup>7</sup> It remains to be investigated what the exact environment(s) for *ge*-deletion in German is (are).

<sup>8</sup> That it is not possible to inflect these nominals (even though they are *stems*) is due to a semantic constraint. A substantial number of outputs from this rule have been entered into the lexicon, have undergone changes in meaning and *can* take a plural inflection:

<i>gebéd</i>	(prayer)	<i>gebéden</i>	(prayers)
<i>gezáng</i>	(song)	<i>gezángen</i>	(hymns, songs)
<i>gelúid</i>	(noise)	<i>gelúiden</i>	(noises)
<i>gevécht</i>	(fight)	<i>gevéchten</i>	(fights)

In particular, the durative action-like aspect of meaning has been lost in these cases. If we ‘force’ that interpretation (of action nominal) onto for instance a noun like ‘*gevécht*’ in a sentence:

*Dat gervecht moet nou maar eens afgelopen zijn!*  
(That bickering has to stop for once and for all!)

We cannot pluralize ‘*gevecht*’ without losing the active, durational meaning.

<sup>9</sup> The derivational affix *-baar* attaches to verb *stems* to form adjectives, as follows:

*simple stems:*

<i>hoor</i>	(hear)	<i>hoórbàar</i>	(audible)
<i>voel</i>	(feel)	<i>voélbàar</i>	(tangible)
<i>merk</i>	(notice)	<i>mérkbàar</i>	(noticeable)
<i>laak</i>	(blame)	<i>laákbàar</i>	(objectionable)

*complex stems (prefixations):*

<i>verstél</i>	(adjust)	<i>verstélbàar</i>	(adjustable)
<i>aanvaard</i>	(accept)	<i>aanvaárbàar</i>	(acceptable)
<i>bedwing</i>	(control)	<i>onbedwíngbàar</i>	(uncontrollable)
<i>geniét</i>	(enjoy)	<i>geniétbàar</i>	(enjoyable)

and also to *samenkoppelingen*, where the *verbal* part has to be a *stem*:

<i>uitvoèren</i>	(execute)	<i>uitvoérbàar</i>	(feasible)
<i>aántàsten</i>	(affect, attack)	<i>aantástbàar</i>	(assailable)
<i>íntrekken</i>	(retract)	<i>íntrekbàar</i>	(retractable)

Thus, as Zonneveld (pers. comm.) observes, in the following forms:

<i>onbegaánbaar</i>	(impassable)
<i>onbestáanbaar</i>	(impossible)
<i>verstaánbaar</i>	(intelligible)
<i>onversláanbaar</i>	(invincible)
<i>afziénbaar</i>	(foreseeable)



*begaan, bestaan, verstaan, verslaan* and *zien*, thus *gaan, staan, slaan* and *zien* have to be considered *stems* rather than inflected forms.

Forms ending in the *derivational* affix *-heid*, such as

*innémendheid* (charm)  
*voorkómendheid* (obligingness)

are *nouns* based on an *adjective*. Just as in:

<i>zálig</i>	(blessed)	<i>záligheid</i>	(blessedness)
<i>dom</i>	(stupid)	<i>domheid</i>	(stupidity)
<i>goed</i>	(good)	<i>goédheid</i>	(goodness)
<i>goddeloós</i>	(godless)	<i>goddeloósheid</i>	(godlessness)
<i>érfelijk</i>	(hereditary)	<i>érfelijkheid</i>	(heredity)

Thus, in *innémend* (charming) and *voorkómend* (obliging) the affix *-end* is *not* an inflectional ending, since it changes the category of the verb to which it attaches to the category adjective. Inflectional affixes typically do not change the category of the element they are attached to.

<sup>10</sup> Or, more general:

$[ \begin{smallmatrix} infl \\ aff \end{smallmatrix} ] \rightarrow \phi / \text{--- } V_S$  , if  $V_S$  branches (is of the form  $[X Y]_{V_S}$  )

This formulation of the rule makes slightly different predictions, in that it is not the *prefix* (or *affix*) status of an element in  $V_S$  that causes *ge-* to delete, but *any* element in addition to a  $V_S$  or  $V_r$  in  $V_S$ .

In addition to reanalysed *saamenkoppelingen* such as *beéldhòuwen* (sculpture), *liéfkòzen* (caress), etc. in which the first element is a  $N_r$  or  $A_r$  and the second element a  $V_r$ , there exists a class of verbs in which the *first* element is verbal, the *second* nominal:

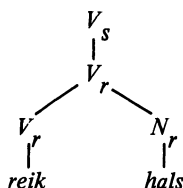
<i>kláppertànden</i>	(his teeth chatter = <i>hij kláppertàndt</i> )
<i>schúimbèkken</i>	(foam at the mouth)
<i>réikhàlzen</i>	(long for)

Inflectional forms:

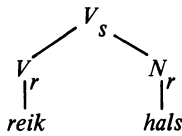
past sg.	past participle	infinitive with <i>te</i>
<i>kláppertàndde</i>	<i>gekláppertànd</i>	<i>te kláppertànden</i>
<i>schúimbèkte</i>	<i>geschúimbèkt</i>	<i>te schúimbèkken</i>
<i>réikhàlsde</i>	<i>geréikhàlsd</i>	<i>te réikhàlzen</i>

These verbs exhibit an  $\hat{S}W$  prominence pattern and *ge-* does *not* delete. There is no evidence that the source of these verbs is a *saamenkoppeling* (note that the *first* element is verbal), as is the case for example for the verb *stófzùigen* (litt. suck dust = vacuum clean).

If *ge-* deletes if  $V_S$  branches, then these verbs have to have complex *roots*:



If the presence of a derivational *prefix* causes *ge-* to delete, then these verbs may have complex *stems*:



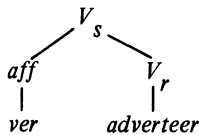
Further study of Dutch morphology may offer clues as to what the structure of these verbs is and thus what the precise conditions are for *ge-* deletion.

The latinate vocabulary might seem to be problematic for an approach to *ge-* deletion in which the environment in which *ge-* deletes is claimed to be the presence of derivational prefixes in the stem. However I think that there is evidence that these verbs are (complex) *roots* and therefore, as predicted by the rule, *ge-* will not delete.

There exists a number of *prefixed* latinate verbs, for example (from De Vries, translations mine):

<i>beconcurreren</i>	(compete – transitive)
<i>bediscussiëren</i>	(discuss – transitive)
<i>bejureren</i>	(adjudge)
<i>versymboliseren</i>	(symbolize)
<i>verprocederen</i>	(litigate)
<i>veradverteren</i>	(advertise)
<i>verassureren</i>	(insure)
<i>vermaterialiseren</i>	(materialize or commercialize)
<i>verlatiniseren</i>	(make/become latinate)

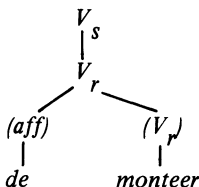
*Ver-* and *be-* are *root* adjuncts, so the structure of these verbs must be the following:



Whether in Dutch these *roots* are complex or not is irrelevant for the rule of *ge-* deletion. The presence of the prefix *ver-* or *be-* causes *ge-* to delete. It is quite likely that these verbs are introduced into the language as internally unstructured, since only a few latinate 'roots' are associated with more than one prefix. The meaning of the latinate verbs in Dutch is largely noncompositional, which makes it unlikely that latinate 'prefixes' have independent morphological status in Dutch. An exception may be the prefix *dé-* with meaning *ont-* ('de' in English as in *demilitarize* or 'dis' as in *dismember*). Examples are:

<i>monteren</i>	(mount)
<i>dèmonteren</i>	(dismount)

However, the past participle of 'demonteren' is *gedèmontéerd*, so for inflectional purposes *de-* is part of the verb *root*:



<sup>11</sup> All verbs of this type involve the 'prefix' *her*. *Her* is prominent, but this cannot be due to the application of the prefix stress rule, since the vowel following *her* in these verbs is prominent:

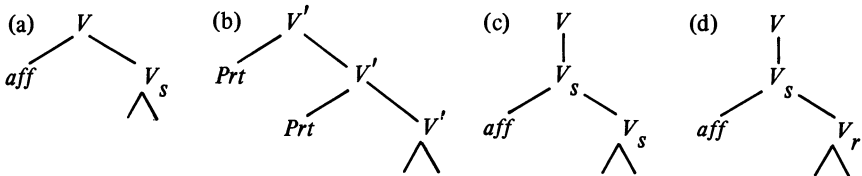
<i>indèlen</i>	(divide, group)
<i>ùitzènden</i>	(broadcast)
(samenkoppelingen!)	

The past participle and the infinitive marked by *te* show that these verbs are analysed as *samenkoppelingen*. There are however *no* finite forms for these verbs, neither in a root clause (where Verb-second would operate), nor in a subordinate clause, where no rule affects the elements of *V*.

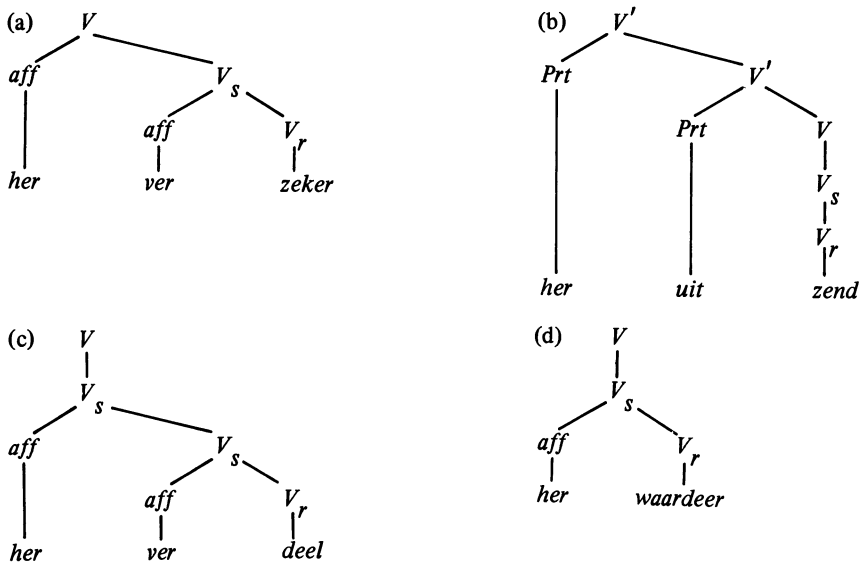
(Curiously, verbs with *her*, whether a prefixation or a *samenkoppeling*, always have *inseparable* finite forms (if any). So even if multiple analyses are available, still *only inseparable* finite forms are found.)

The explanation for the fact that there are no finite forms at all for verbs like '*héruitzenden*' etc. may be the following. Since '*ùitzènden*', '*ópvoeden*', etc. have *separable* finite forms (since they are regular *samenkoppelingen*), forms like '*\*héruitzendt*' etc. are simply not possible.

It is feasible that finite forms of the *samenkoppelingen* '*héruitzenden*' '*héropvoeden*' are prohibited due to a condition on what a transformation like Verb-second can leave behind (a constituent), so that in main clauses at least '*\*zendt – her uit*' etc. would be blocked. However, in subordinate clauses, '*\*héruitzendt*' in which no transformation is involved, sounds just as bad. The question then is, what the structure of these verbs is. Based on the fact that *her* always has to *precede* somehow the verb it has in its 'scope', I propose the following structures for verbs with *her*:



For example:



I.e. *her*, which was originally just a *root* adjunct, has become an adjunct to all levels of the 'verb', thereby becoming a free morpheme as well:

- (a) *V*-adjunct, (b) *V'*-adjunct, (c) *V<sub>G</sub>*-adjunct, (d) *V<sub>J</sub>*-adjunct.

There is no difference in meaning involved, the only difference shows up in the inflectional forms.

In a) and b), *her* is always prominent, in c) and d) it depends on the following syllable.

<sup>12</sup> The *only* inflectional form in which the distinction between a prefixation and a complex root or a *saamenkoppeling* is clearly brought about, is in the past participles:

*ge* →  $\phi$  before a stem immediately dominating a prefix;

*ge* ↗  $\phi$  before a complex root (i.e. the root dominates a prefix)

<sup>13</sup> Namely, the prefix '*over-*' means among other things 'too much, excessive', the prefix '*onder-*' means among other things 'too little, not enough'. The particle '*over*' and the particle '*onder*' do not have that meaning.

<sup>14</sup> Term suggested by Wim Zonneveld.

<sup>15</sup> It should be noted that there exists a group of verbs in which the stem is prefixed, which behave as *regular* *saamenkoppelingen* (with a prefixed stem):

<i>návertèllen</i>	(retell)
<i>meégenièten</i>	(enjoy (along) )
<i>dórverkòpen</i>	(re-sell)
<i>uítvertèllen</i>	(finish to tell)
<i>uítbestèden</i>	(put out to contract)
<i>vóorberèiden</i>	(prepare)

Inflectional forms:

past participle	past tense sg.	infinitive
<i>návertèld</i>	<i>vertèlde – ná</i>	<i>ná te vertèllen</i>

<sup>16</sup> Other examples are:

<i>gróndvèsten</i>	(found)
<i>hándhàven</i>	(maintain)
<i>brándmèrken</i>	(stigmatize)
<i>waárbòrgen</i>	(guarantee)
<i>kielhàlen</i>	(keelhaul)
<i>vóetbàllen</i>	(play soccer)
<i>vrijwàren</i>	(safeguard)
<i>dwársbòmen</i>	(thwart, frustrate)
<i>zégevièren</i>	(triumph)
<i>dóodvèrven</i>	(tip)
<i>oórmèrken</i>	(earmark)

<sup>17</sup> In general, if analysis as complex root is made (or reanalysis) only *one* verbal entry will continue to exist, namely the 'new' form. However, there are two exceptions:

- (1) the verb '*stófzùigen*' (suck dust = vacuum clean); both '*gestófzùigd*' and '*stófgezògen*' are used by speakers;
- (2) the problematic verbs of section 4, for which *several* entries may be listed in the lexicon, each with its own *defective* inflectional paradigm.

<sup>18</sup> According to De Vries and Schultink, forms like '*hèrgroepèerd*' (regrouped) and '*ónderwaardeèrd*' (underestimated), i.e. without past participle prefix *ge-* are

somewhat old-fashioned. The more natural sounding past participles are 'gehérgroepèerd' or 'hérgegroepèerd' and 'geónderwaardeèrd', which means that the analysis as *samenkoppeling* or complex root is preferred over the analysis as prefixation.

<sup>19</sup> In addition there is the matter of productivity of affixes. The relation between productivity and the  $\bar{S}\bar{W}$  condition is as follows: productivity (or the lack thereof) determines which structures can be analysed as complex roots (in principle), the  $\bar{S}\bar{W}$  condition limits this to a subset of the structures in which that analysis is possible.

<sup>20</sup> That the environment should be modified to 'not primary stressed' for the first prefix (counted from X on), can be shown by the following examples:

*aànvaárden* has a past participle '*aànvaárd*'

(accept)

*vòorkómen* has a past participle '*vòorkómen*'

(prevent)

However, '*aan-*' and '*voor-*' in these verbs are not *unstressed*, as *be-*, *ge-*, etc., but carry an at most secondary stress.

<sup>21</sup> It is likely that these differences in stress have to be attributed to a different morphological structure.

<sup>22</sup> Note: in Dutch we find '*gestudéerd*' (studied), '*gehalvéerd*' (bisected), etc. So there is no reason for the Dutch child to assume that stress is a factor involved in *ge-*deletion, based on the inflectional forms of *simple* stems. The German child, who is confronted with forms like '*studiért*', etc., has concrete evidence for assuming that in German *ge-*deletion is (partly) stress governed.

<sup>23</sup> This form is found besides:

*herkaúwen* – *herkaúwde* – *herkaúwd* – *te herkaúwen*

i.e. the regular prefixation, and besides:

*hérkaúwen* – *hérkaúwde* – *hérkaúwd* – *te hérkaúwen*

(Koenen Endepols 1960).

## Appendix

Rules assumed, producing the patterns associated with prefixations and *samenkoppelingen*:

- (1) Finite forms undergo the verb placement transformation ('Verb-second') in root clauses, assuming that Dutch is underlyingly SOV; formulation of the rule, from Jan Koster (1975):

*Root T*

SD:  $Comp_S [X V Y] Z$

1            2 3 4 5

SC: 1            3+2  $\phi$  4 5

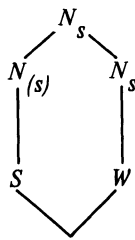
Cond.: *V* is tensed

- (2) Infinitives marked by *te* (to). To be noted is that 'te', governed by the preceding verb, is introduced immediately before the following verb *stem* (as is the past participle prefix *ge-*). The following distribution thus obtains:

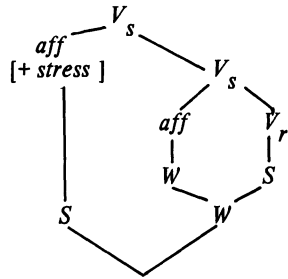
i.e.  $te \propto V$  (prefix.)  
 $\propto te V$  (samenk.)

A graph with four nodes:  $N_s$  at the top,  $V_s$  at the top right,  $W$  at the bottom right, and  $S$  at the bottom left. Edges connect  $N_s$  to  $V_s$ ,  $N_s$  to  $S$ ,  $V_s$  to  $W$ , and  $W$  to  $S$ . A label  $aff [+stress]$  is positioned near the edge between  $N_s$  and  $S$ .

## Compounds



But:



The following rule will have that effect:

Given 2 sisternodes  $N_1 N_2$  in the configuration

- $[N_1 N_2]_\alpha$
- 1)

if  $\alpha \neq V_s$ ,  $N_2$  is W (eak)
- 2)

if  $\alpha = V_s$ ,  $N_2$  is S (trong), unless

$N_2$  itself is W S (prefix stress rule)

(Assume also for Dutch

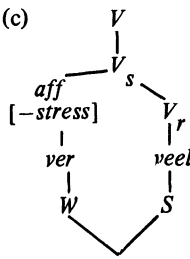
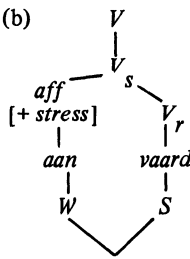
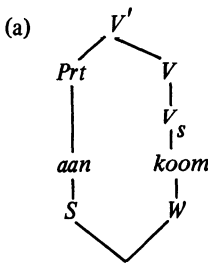
\*S

|

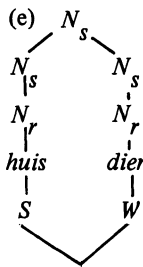
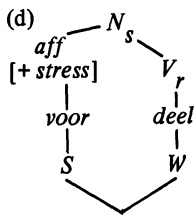
Vowel

[−stress])

These rules will assign the following prominence patterns for example:

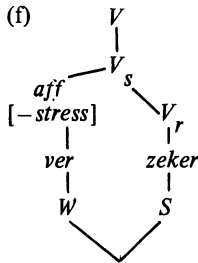


And to deverbal nouns and nominal compounds:

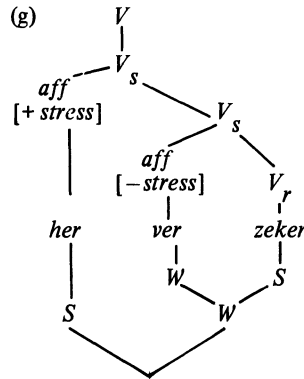


- Glosses:
- (a) arrive
- (b) accept
- (c) annoy
- (d) advantage
- (e) pet
- (f) insure
- (g) reinsure

And also:



But:



Note that pattern g) cannot be derived from the rule which assigns prominence to prefixes of deverbal nouns. These prefixes are *always* prominent, verb prefixes are prominent only in case the syllable following is *weak* (stem internally).

We have seen that only structures related in an  $\hat{S}W$  pattern can be re-analysed or analysed as complex roots. This entails that information about relative prominence is listed in the lexicon with the particular entries.

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## BOUNDARIES, WORDCLASSES, AND THE ACCENTUATION OF DERIVED WORDS IN DUTCH\*

H. SCHULTINK

### 1

In some recent literature on the accentuation of derived English and Dutch words the nature of the boundaries immediately preceding the suffixes and immediately following the prefixes plays a prominent part. Such an approach, however, leads to as yet unsolved problems. For this reason we propose below an alternative account for Dutch: all affixes are surrounded by + (formative) boundaries, and accentuation of derived words is described rather in terms of wordclasses. Synthetic compounds provide additional evidence for these hypotheses.

### 2

For English, Chomsky and Halle (1968) distinguish between two types of affixes:<sup>1</sup> 'Alongside of the affixes that affect stress placement . . ., there are other "neutral affixes" which characteristically play no role in the placement of stress, for example, the adjective-forming affixes *-y*, *-like*, *-able*, *-ish*, and affixes such as *-ing*, *-past tense*, *-hood*, *-ness*, *-ly*, *-wise*. We can indicate the fact that an affix is neutral by making use of the # boundary' (84-5). 'Notice that the presence of the # boundary is quite well motivated on different grounds in many of these cases' (85). 'So far, then, we have two classes of affixes, those that assign primary stress by the Main Stress Rule, and those that carry # boundary and are therefore neutral' (86).

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\* The basic thoughts for this paper were developed during my stay at the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (N.I.A.S.) at Wassenaar in the course of the academic year 1975-6. The final version was completed in December 1976, in particular, before the appearance of G.E. Booij's thesis *Dutch Morphology. A study of word formation in generative grammar* (Foris Publications, Dordrecht, 1977). I have profited highly from comments on earlier versions by R.P. Botha, H. Gilijamse, M.A.C. Huybregts, and W. Zonneveld.

Siegel (1974) and Aronoff (1976), among others, have elaborated upon this idea. Thus, Siegel (1974: 148) proposes that in English 'Class I affixes are introduced with the + boundary, and Class II affixes are introduced with the # boundary. This system of two boundaries captures the insight that Class I prefixes and suffixes are stress-determining, whereas Class II prefixes and suffixes are stress-neutral. Class II suffixes neither cause a rightward shift in stress in words they attach to nor do they receive stress themselves.' She continues: 'in the overwhelming number of cases, Class II affixes attach to words. Class I affixes attach to both stems and words' (151). This leads Siegel to a theory of the English lexicon in which 'Class I affixation precedes Class II affixation' and 'The cyclic stress assignment rules follow Class I affixation and precede Class II affixation' (152). 'In the proposed system, it is the ordering of Class II affixation after Class I affixation which prevents Class II affixation from attaching to stems. It is the ordering of Class II affixation after the cyclic stress assignment rules which prevents Class II affixes from being stress-determining' (155). Another, equally important, consequence of Siegel's system pertains to the stacking up of Class I and Class II affixes: 'Class I affixation feeds Class II affixation, but Class II affixation does not feed Class I affixation' (182). This constraint on affixation 'restricts the generative capacity of the lexicon by making it impossible to derive Class I-affixed words from Class II-affixed words' (182).

While Siegel pays hardly any systematic attention to counter-examples to the latter restriction, Aronoff (1976) does so explicitly within the framework of his own theory of word formation. Aronoff's rules of affixation can operate both on the input *and* on the output of the phonological component. Suffixes attached to underlying forms are preceded by the boundary symbol +. These + boundaries do not restrict the application of the phonological cycle. Suffixes added at a point in the phonological derivation after the application of all cyclic rules are preceded by the boundary symbol #. They can no longer influence the accentuation of words they are part of. This leads Aronoff (84-5) to the justified observation that one should hence not expect to find formations of the type  $X\#a+b$ , where a suffix preceded by + follows a suffix preceded by #. Nevertheless – as Aronoff himself notices – there are English words such as *analyze#ability*, *standard#ization*, and *govern#ment+al*. Morphologically, he claims, these words pose no problem. According to him word formation should be viewed as a historical process, which is not repeated in every derivation. The legitimate underlying form of a word such as *standard#ize* may without objection be suffixed with *+ation*, and similarly for the other two examples.

Phonologically, however, there are difficulties to account for. In the three examples given, stress is no longer on the same vowel as within the bases *analyze*, *standard*, and *govern*, but rather on the portion following the #. Aronoff makes two attempts to avoid this impasse. On the one hand he investigates the possibilities of reducing the # boundary to a + boundary within the cyclic domain where the sequence of # boundary followed by a + boundary occurs for the first time. Under such a proposal a word such as *standard#ize+ation* would in the last cycle be represented as *standard+ize+ation*. On the other hand, he investigates the possibility of treating *standard#ization* as a compound. Both approaches, however, lead to new, as yet unsolved complications. Aronoff concludes the paragraph on the formations *analyze#abil+ity*, *standard#ize+ation*, and *govern#ment+al* therefore as follows: '[these forms] stand as an important counterexample to any known theory of English phonology, but not morphology. Formally, they are of a single type:  $X\#a+b$ . They are not isolated exceptions, but represent large classes of words' (85).

## 3

The hypotheses of Chomsky and Halle (1968), Siegel (1974), and Aronoff (1976) just discussed have been explicitly developed for English only, and hence make no claim of universal validity. Nevertheless, Booij (1975), Zwarts (1975), and Smith (1976) have made interesting attempts at testing the validity of these hypotheses against data from Dutch. These attempts assume implicitly the applicability also for Dutch of the Main Stress Rule developed for English, or a variant. This assumption is not at all obvious, however. As early as 1901 Te Winkel wrote that 'Im Niederländischen ist die Regel des Wortaccents die nämliche wie im Germanischen überhaupt' (814). And did not Halle and Keyser (1971:3) in their turn, and equally justifiably, observe on the accentuation of English words that 'the rule that was postulated to assign the stress did not resemble that of any Germanic language but rather was all but identical with the stress rule of Classical Latin'?

Be this as it may, corresponding to the English stress-determining Class I suffixes preceded by a + boundary we find suffixes of two types in Dutch: on the one hand those which have main stress themselves, such as *-aan*, *-eer*, *-ees*, *-eus*, *-ier*, and *-in* in:

<i>Syracu'saan</i>	'Syracusan'
<i>(ik) figu'reer</i>	'(I) figure'
<i>Chi'nees</i>	'Chinese'
<i>fa'meus</i>	'famous'
<i>herber'gier</i>	'inn-keeper'
<i>be'rin</i>	'she-bear'

on the other hand those suffixes which cause a rightward shift in stress in the words they attach to, for instance *-isch*, *-lijk*, and *-zaam* in:

<i>pro'zaïsch</i>	'prosaic'	cf. <i>'proza</i>	'prose'
<i>nood'zakelijk</i>	'necessary'	<i>'noodzaam</i>	'necessity'
<i>her'bergzaam</i>	'hospitable'	<i>'herberg</i>	'inn'

Corresponding to the English stress-neutral Class II suffixes we find in Dutch suffixes such as *-aar*, *-dom*, *-el*, *-erd*, and *-schap* in:

<i>'Eindhovenaar</i>	'inhabitant of <i>'Eindhoven</i> '		
<i>'hertogdom</i>	'duchy'	cf. <i>'hertog</i>	'duke'
<i>(ik) 'krabbel</i>	'(I) scribble'	<i>(ik) 'krab</i>	'(I) scratch'
<i>'vrolijkerd</i>	'merry person'	<i>'vrolijk</i>	'merry'
<i>'bondgenootschap</i>	'alliance'	<i>'bondgenoot</i>	'ally'

It is true, however, that the suffixes of this last-mentioned class have a distinct secondary accent when they contain a vowel other than [ə].

Under the assumption that stress-determining Dutch suffixes such as *-aan* and *-isch* are preceded by a + boundary, and suffixes such as *-aar* and *-dom* by a # boundary, the potential existence of  $X\#a+b$  formations would present us for Dutch with the same problem as Aronoff faced for English. It is important to observe first in this respect that within Dutch words, just as in English, stress-determining suffixes do much more often precede the so-called stress-neutral ones than vice versa. And similarly, also in Dutch stress-determining suffixes follow stems (instead of words) much more frequently than do stress-neutral ones. Nevertheless, we can find, also in Dutch, words in which a stress-determining suffix is preceded by a so-called stress-neutral suffix. This has also been observed by Zwarts (1975) and Smith (1976).

Unambiguous examples of a Dutch word formation-type  $X\#a+b$  would belong to the following categories:

- (1) Words with stress-neutral suffixes followed by suffixes with main stress, viz.

(a) -'es, -'ij, and -'in can be preceded by the stress-neutral suffixes -aar, -aard, and -er. We have at our disposal the following data:

- aar-es: *diena'res* 'woman servant'; *lera'res* 'woman teacher'; etc.
- aar-ij: *minna'rij* 'love-making'; *geweldena'rij* 'tyranny'; etc.
- aar-in: *molena'rin* 'woman miller'
- aard-es: *ruwaar'des* 'lady governor'
- aard-in: *ruwaar'din* 'lady governor'; *grijsaar'din* 'grey haired woman'
- er-es: *danse'res* 'woman dancer'; *dichte'res* 'woman poet'; etc.
- er-ij: *suffe'rij* 'drowsiness'; *vliege'rij* 'aviation'; etc.
- er-in: *bakke'rin* 'woman baker'; *Dantzige'rin* 'woman from Dantzig';  
*jage'rin* 'woman hunter'

It is clear that this is a systematic pattern of successive suffixes. The suffix -'ij is even preceded by two stress-neutral suffixes, -el and -aar, in the word *rijmela'rij* 'jingle'.

(b) -'ij, moreover, and -'ist can be preceded by the stress-neutral suffix -schap. Data:

- schap-ij: *heerscha'ppij* 'domination'; *maatscha'ppij* 'company';
- schap-ist: *landscha'ppist* 'landscapist'.

(2) Words with stress-neutral suffixes followed by suffixes causing a rightward shift in stress, viz. stress-shifting -lijk can be preceded by stress-neutral -schap. Data:

- schap-lijk: *maat'schappelijk* 'social' (cf. *'maatschap* 'society');
- vriend'schappelijk* 'friendly' (cf. *'vriendschap* 'friendship')

All these cases are potential counterexamples to hypotheses which distinguish for Dutch between suffixes preceded by a + boundary and suffixes preceded by a # boundary. The question arises therefore whether this distinction is indeed useful for Dutch.<sup>2</sup>

The data presented in section 3 imply that we can distinguish in Dutch between three categories of suffixes:

- (1) The first category contains, for instance, the earlier mentioned suffixes *-aan*, *-eer*, *-ees*, *-eus*, *-ier*, and *-in* which receive main stress;
- (2) The second category contains, for instance, the earlier mentioned suffixes *-isch*, *-lijk*, and *-zaam* which retract main stress to the nearest stressable vowel, i.e. to the nearest non-[ə] vowel;
- (3) Finally, the third category contains, for instance, the earlier mentioned stress-neutral suffixes *-aar*, *-dom*, *-el*, *-erd*, and *-schap*.

When the only suffixal vowel is [ə], the suffix is stress-less, cf. *-lijk*, *-el*, *-erd*. All other suffixes of the second and third categories have a secondary accent. In some cases one cannot definitely decide on the category of a non-main stress suffix. When a suffix is attached solely to words the rightmost non-[ə] vowel of which carries main stress, it can be either of the stress-attracting category or of the stress-neutral category. Examples of this type are derivations in *-erik*. This suffix is attached only to words which already have main stress on the rightmost non-[ə] vowel; cf. *'lomp-erik* 'rude person', next to *'lomp* 'rude'; and *onbe'leefderik* 'impertinent person', next to *onbe'leefd* 'impolite'.

It is a clear characteristic of the first category of suffixes that it comprises mainly borrowed suffixes (more precisely French ones), in verbs such as *figureer*, in nouns such as *herbergier*, and in adjectives such as *fameus*. It is a characteristic of the second category, on the other hand, that it contains exclusively adjective-deriving suffixes: *prozaïsch*, *noodzakelijk*, *herbergzaam*. Chiefly nouns, such as *Eindhovenenaar*, *hertogdom*, *vrolijkheid*, and *bondgenootschap*, and verbs, such as *(ik) krabbel*, are derived with suffixes of the third category. This category further contains the plural suffixes *-s* and *-en*, all other so-called inflection-suffixes, the suffixes of comparison *-er* and *-st*, and the suffixes used to derive the ordinals, *-de* and *-ste*. On the face of it, the third category contains but a few adjective-forming suffixes. The following are the ones of which I am aware:

<i>-achtig</i> :	<i>'struisvogelachtig</i>	'ostrich-like', etc.
<i>-baar</i> :	<i>be'oordeelbaar</i>	'judge-able', etc.
<i>-erig</i> :	<i>'judasserig</i>	'Judas-like'
<i>-ig</i> :	<i>'lilliputtig</i>	'dwarf-like', etc.
<i>-loos</i> :	<i>'stadhouderloos</i>	'stadtholder-less', etc.
<i>-s</i> :	<i>'Oostenrijks</i>	'Austrian', etc. <sup>3</sup>

In a limited number of words the suffix *-achtig* behaves as if it were a suffix of the first category: *dee'lachtig* 'participatory', *kram'pachtig*

'spastic', *reu'sachtig* 'huge', *waa'rachtig* 'truthful', etc., with partly idiosyncratic semantic properties. Also *-loos* has for some people main stress, in *godde'loos* 'ungodly', *trouwe'loos* 'unfaithful', and *werke'loos* 'unemployed'. *-loos* behaves as a suffix of the second category in *mee'dogenloos* 'ruthless', next to *'mededogen* 'pity'. In diagnostically relevant cases *-erig* behaves almost always as a suffix of the second category, cf. for instance *hobbe'zakkerig* 'dowdy' (adj.), next to *'hobbezak* 'dowdy' (noun); and *kou'kleumerig* 'shivery', next to *'koukleum* 'frowster'. Often also *-ig* causes a rightward shift, cf. for instance *eer'biedig* 'respectful', next to *'eerbied* 'respect'; *ieze'grimmig* 'surly', next to *'iezegrim* 'grumbler'; and *mis'dadig* 'criminal' (adj.), next to *'misdaad* 'crime'. Cases where also *-baar* and *-s* cause a rightward shift in stress will be discussed in section 6.

We have had occasion before to observe that Siegel and Aronoff do not only make a distinction for English between two classes of suffixes, but also between two classes of prefixes. The latter are followed by a + boundary and a # boundary, respectively. By and large, Booij and Zwarts again agree on a similar distinction for Dutch. Traditionally, on the other hand, Dutch prefixes are subdivided into the following three categories:

- (1) The first category contains prefixes which always carry main stress: *aarts-* in the sense of 'utterly', *door-* in the sense of 'through and through', *in-* in the sense of 'intensely', *oer-* 'ultra', and *over-* in the sense of 'too much', as for instance in:

<i>'aartslui</i>	'utterly lazy'	<i>'oergezellig</i>	'extremely cosy'
<i>'doornat</i>	'soaking wet'	<i>'overmoe</i>	'exhausted'
<i>'inlief</i>	'extremely sweet'		

- (2) The second category contains prefixes which are always stressless, and also do not influence the accentuation of the derivative: *be-*, *er-*, *ge-*, *ont-*, and *ver-*, for instance in:

<i>be'oordelen</i>	'to judge'	<i>ont'kennen</i>	'to deny'
<i>er'kennen</i>	'to admit'	<i>ver'spreken</i>	'to err'
<i>ge'lach</i>	'laughter'		

- (3) The third category contains prefixes which in some cases carry main stress, and in others secondary stress: *her-*, *on-*, and *wan-*, cf. *'herdruk* 'reprint', next to *her'drukken* 'to reprint', *'onmens* 'brute', next to *on'oorbaar* 'inadmissible'; and *'wantoestand* 'abuse', next to *wan'trouwig* 'suspicious'.

These distinctions enable us to make some observations on the accentuation of affixed Dutch words.

- (I) In a word with just one affix of the first category of either suffixes or prefixes, the affix carries main stress, for instance *be'rin* and *'aartslui*. In words with a sequence of first category suffixes, the rightmost of these suffixes carries main stress, for instance *art-ist-ic-i'teit* 'artisticity', and *art-ist-'iek-heid* 'being artistic'. Words with a sequence of first category prefixes are not known to us. In words with one first category prefix, and one or more first category suffix(es), the prefix carries main stress, for instance *'aarts-elit-air* 'utterly elitist', and *'oer-art-ist-iek* 'extremely artistic'.
- (II) In a word formed with an affix from one of the other categories, affixation has no consequences generally for accentuation, cf. for instance *'Eindhovenaar* next to *'Eindhoven*, *be'oordelen* next to *'oordelen*, and *on'oorbaar* next to *'oorbaar*. However, this last rule has two restrictions:
- (III) In nouns created by prefixation a stressable prefix carries main stress, cf. for instance *'herdruk* next to *'druk*, and *'onmens* next to *'mens*;
- (IV) In adjectives created by suffixation the suffix generally attracts main stress, cf. *pro 'zaisch* next to *'proza*, and *eer'biedig* next to *'eerbied*.

As compared to nouns and adjectives, verbs require special attention. There is only one affix used in verb-formation which always carries main stress, *-eer* as in *figu'reer*. All other cases of verb-formation have no consequences for accentuation, cf. for instance *(ik) 'krabbel* and *(ik) 'krab*, *(ik) 'kruisig* '(I) crucify' next to *'kruis* 'cross', *ont'kennen* next to *'kennen*, and *her'drukken* next to *'drukken*. The same holds for verbs formed with prefixed particles: *aan*, *achter*, *door*, *mis*, *om*, *onder*, *over*, *vol*, *voor*, and *weer* in for instance:

<i>aan'schouwen</i>	'to behold'	<i>onder'schrijven</i>	'to endorse'
<i>achter'volgen</i>	'to pursue'	<i>over'leven</i>	'to survive'
<i>door'waden</i>	'to ford'	<i>vol'brenge</i>	'to fulfil'
<i>mis'doen</i>	'to do wrong'	<i>voor'zien</i>	'to foresee'
<i>om'vatten</i>	'to enclose'	<i>weer'klinken</i>	'to resound'

All these are unmistakeably words.

These words, however, contrast with combinations of verbs and particles which are called 'separable verbs'. In surface structure the order of the component parts of these combinations is not fixed, and they can



also be separated by other sentential elements. And all this without affecting the semantics of the sentence. As an example, consider the verb *toegeven* 'to admit'. Next to *toegeef* in a subordinate sentence such as *Wanneer ik dat toegeef* 'When I admit this', *toegeven* in a sentence such as *Dat zal hij nooit toegeven* 'He will never admit this', and *toegegeven* in a sentence such as *Hij heeft alles toegegeven* 'He has admitted everything', we find with the same meaning *Ik geef toe* 'I admit', *toe te geven* in *Hij wenst dat niet toe te geven* 'He does not want to admit that' and *toe heeft gegeven* in *Dat hij alles toe heeft gegeven* 'That he has admitted everything'.

The mutual interchangeability and separability of the components distinguishes these combinations from words, such as for instance *aanschouwen* c.s. This distinction is paralleled by a difference in accentuation. Within the so-called separable verbs the main stress is always on the non-verbal part, for instance, *Ik kom 'aan* 'I arrive', *Dat ik 'aankom* 'That I arrive', *We nemen 'waar* 'We observe', *Dat we 'waarnemen* 'That we observe', *'achterhouden* 'to withhold', *'achter te houden* 'to withhold', *Het is 'doorgegeven* 'It has been passed', and *Dat het 'door is gegeven* 'That it has been passed'. In fact the non-verbal part has group accent in these cases. On the other hand, we have seen that in non-separable words of the type *aanschouwen* main stress is always on the verbal part, for instance *Ik aan'schouw* 'I observe', *Dat we achter'volgen* 'That we pursue', *(te) door'waden* 'to ford', and *over'leefd* 'survived'. This last observation allows us to maintain, as in observation II above, that neither prefixation nor suffixation affects the accentuation of verbs.

When the particles just mentioned are used in the derivation of nouns rather than verbs, they always carry main stress: for instance in

<i>'aanval</i>	'attack'	<i>'overval</i>	'assault'
<i>'onderzoek</i>	'research'	<i>'misdaad</i>	'crime'
<i>'overdruk</i>	'reprint'	<i>'misdrijf</i>	'criminal offence'

This necessitates a reformulation of (III) as follows:

(III') In nouns created by prefixation a stressable prefix or particle carries main stress.

Before we formulate on the basis of these observations the relevant rules of stress assignment, we mention here two supplementary observations:

(V) In words formed by prefixation of *her-* or a stressable particle, the

prefix or particle carries main stress, provided that the vowel immediately to the right does not bear primary stress.

The main lines of this observation have been formulated earlier in Schultink 1973: 415, inspired by Kiparsky 1966. In this way we can account for the accentuation of *'herbewapenen* 'to rearm', *'herverzekerd* 'reinsured', *'onderverhuurd* 'sublet', and *'oververhit* 'overheated'. This accentuation is dominant vis-à-vis the primary accentuation of suffixes mentioned under (I). This is shown by the accentuation of words such as *'herbestuderen* 'to restudy', *'herclassificeren* 'to reclassify', and *'hermassage* 'additional massage'. As we have demonstrated above, the primary accentuation of suffixes is also overruled by the accentuation of primary stressed prefixes. In case the distinction between prefixes and particles can indeed be shown to be useful, *her-* is likely to be among the latter, since it can also be separated from its 'fellow'-verbs (cf. Schultink 1973: 413-4). In any case, observation (V) does not hold for affixation of an undisputed prefix such as *on-*, cf. for instance, *onbe'strijdbaar* 'incompatible', *onge'kend* 'unknown', and *onwaar'deerlijk* 'inappreciable'.<sup>4</sup> For the prefix *wan-* we do not have diagnostically relevant material.

(VI) Words with main stress on their rightmost stressable vowel have a secondary accent on their leftmost stressable vowel, provided that these vowels are separated by at least one other vowel.

We find this sixth observation already in Eijkman 1937: 150: 'In foreign words the rhythmical secondary stress precedes main stress, and these stresses are separated by at least one weak syllable.'<sup>5</sup> In all examples given by Eijkman (op. cit.), main stress is on the rightmost stressable vowel, and secondary accent on the leftmost:

<i>,Constanti'nopel</i>	'Constantinople'
<i>,balan'ceren</i>	'to balance'
<i>,phanta'sie</i>	'imagination'
<i>,eksku'seren</i>	'to excuse'
<i>,konso'nant</i>	'consonant'
<i>,phone'tiek</i>	'phonetics'
<i>,fotogra'fie</i>	'photography'

Also Van Dantzig (1901), where the accentuation of Dutch words is indicated with the greatest accuracy, contains many examples supporting our observation, for instance:

<i>,biogra'fie</i>	'biography'
<i>,centrali'seren</i>	'to centralize'
<i>,minuti'eus</i>	'careful'

Moreover, our observation is supported by the fact that a full vowel reduces to [ə] in the second syllable of words such as *hyste'rie* 'hysteria', next to *hy'sterisch* 'hysterical'; *juwe'lier*, next to *ju'weel* 'jewel'; and *profe'teren* 'to prophesy', *profe'tes* 'prophetess', *profe'tie* 'prophecy', next to *pro'feet* 'prophet'.

## 5

The above observations enable us to formulate rules of stress assignment for derived Dutch words. In these rules we use – after Kiparsky 1966: 73 – the feature [ $\pm$  UNSTRESSABLE]. This is of course a non-phonetic feature.<sup>6</sup> Vennemann (1968: 169-70 fn. 81a) has argued against the presence of unstressable vowels in underlying representations, while Chomsky and Halle (1968: 146) do not completely exclude them. In the absence of a detailed investigation into the synchronic source of these vowels in Dutch, we will necessarily accept their presence as given.

The feature [–UNSTRESSABLE] may be introduced via a redundancy rule of the form

$$\begin{bmatrix} +syll \\ -cons \end{bmatrix} \Rightarrow [-UNSTRESSABLE]$$

with the exception to this statement introduced via the redundancy rule

$$[\partial] \Rightarrow [+UNSTRESSABLE]$$

The vowel of for instance the prefix *ont-*, and the *i* of *-ikoos*, *-iteit*, and *-aris* will already in the lexicon be specified as [+UNSTRESSABLE].

We then proceed with the following rules:

## PRECYCLIC RULE

$$(1) \quad \begin{matrix} V \\ [-UNSTRESS] \end{matrix} \Rightarrow [1 \text{ stress}]$$

## CYCLIC RULES

$$(2) \quad \begin{matrix} V \\ [-UNSTRESS] \end{matrix} \Rightarrow [1 \text{ stress}] / \left\{ \begin{matrix} \dots + \dots - \dots + \# \frac{n}{1} \\ \left[ \# \frac{n}{1} + \dots - \dots + \dots \right] \end{matrix} \right\}$$

Condition: there is no boundary in between  $+\dots +$

Rule (2) applies only to strings in which affixes of category (1) occur as the rightmost suffix and/or the leftmost prefix. To this effect, only affixes of category (1) contain a positive mark for this rule. The application of

rule (2) blocks the application of the subsequent rules (3) and (4) below within the same cycle. Nouns, verbs, and adjectives are preceded and followed by a #. Affixes, particles, and stems are preceded and followed by a +. By rule (2), first category affixes receive main stress, when leftmost or rightmost in a word, respectively. The primary accentuation of prefixes dominates that of suffixes. The first part of rule (2) is very probably a subpart of a more general rule that assigns stress to words of Romance origin.

$$(3) \quad \left[ \begin{array}{c} V \\ 1 \text{ stress} \end{array} \right] \Rightarrow [1 \text{ stress}] / [X \# Y \text{ --- } Z]$$

Conditions:

$X$  does not contain ... # [—boundary] ... ;

$Y$  does not contain either a + boundary or  $\left[ \begin{array}{c} V \\ 1 \text{ stress} \end{array} \right]$

$Z$  does not contain ... + ... + #  $\begin{array}{c} n \\ 1 \end{array}$  ].

This rule states that in non-suffixed words the leftmost stressable vowel after one or more prefixes (if any) receives primary stress.

$$(4) \quad \left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right] \Rightarrow [1 \text{ stress}] / [\dots \text{ --- } X + \dots + \# \begin{array}{c} n \\ 1 \end{array} ]_A$$

Conditions:

$X$  does not contain  $\left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right]$ ;

There is no boundary in between + ... +.

Rule (4) states that in suffixed adjectives the rightmost stressable vowel before the rightmost suffix receives main stress.

$$(5) \quad \left[ \begin{array}{c} V \\ 1 \text{ stress} \end{array} \right] \Rightarrow [1 \text{ stress}] / \dots \text{ --- } X \left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right] Y + \# \begin{array}{c} n \\ 1 \end{array} ]_N$$

Conditions:

$X$  does not contain  $\left[ \begin{array}{c} V \\ 1 \text{ stress} \end{array} \right]$  ;

$Y$  does not contain a boundary.

Because of rule (5), affixation of stressable (and unstressable) nominalizing suffixes which do not belong to category (1) has no consequences for the position of main stress in the word.

$$(6) \quad \left[ \begin{array}{c} V \\ 2 \text{ stress} \end{array} \right] \Rightarrow [1 \text{ stress}] / [\# \begin{array}{c} n \\ 1 \end{array} + X \text{ --- } Y + \# \dots ]_N$$

Condition:

There is no boundary in between + . . . + .

In nouns created through prefixation of a stressable prefix or particle, main stress is on this prefix or particle. Probably this rule can be combined with the rule necessary for the accentuation of compound nouns.

$$(7) \quad \left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right] \Rightarrow [2 \text{ stress}] / [\# X \text{ — } \dots V \dots \left[ \begin{array}{c} V \\ \text{—1 stress} \end{array} \right] Y \#]$$

Condition:

$X$  and  $Y$  do not contain  $\left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right]$ .

Rule (7) states that words with main stress on their rightmost stressable vowel receive a secondary accent on their leftmost stressable vowel, provided that at least one other vowel intervenes.

$$(8) \quad \left[ \begin{array}{c} V \\ \text{—UNSTRESS} \end{array} \right] \Rightarrow [1 \text{ stress}] / [\# \overset{n}{1} + X \text{ — } Y + Z \left[ \begin{array}{c} V \\ \text{—1 stress} \end{array} \right]]$$

Conditions:

There is no boundary in between + . . . + ;

$X \text{ — } Y \neq \text{on}$  ;

$Z$  does not contain  $V$ .

Rule (8) gives main stress to stressable prefixes other than *on-*, and to prefixed particles, provided that the vowel immediately to the right does not bear primary stress.

## 6

The rules in section 5 are based on the hypothesis that accentuation of derived Dutch words is governed by word classes rather than boundaries. For supporting evidence we will consider in this section the so-called synthetic compounds.

So far we have concentrated on words derived from *one* other word, such as *berin* from *beer*, or from a stem, such as *(ik) be-gin* '(I) begin', where a word *\*gin* is lacking (but cf. *(ik) ont-gin* '(I) exploit').<sup>7</sup> When a word is derived from another word, the latter itself can be a derived word, or a compound. Thus, *onzinnig* 'nonsensical' is derived from *onzin* 'nonsense', and *onzin* in its turn from *zin* 'sense':  $[[\text{on}[\text{zin}]_N]_N \text{ig}]_A$ . And *drankzuchtig* 'dipsomaniacal' is derived from *drankzucht* 'dipsomania',

which itself is a compound of the words *drank* 'liquor', and *zucht* 'desire':  
 [ [ [drank]<sub>N</sub> [zucht]<sub>N</sub> ]<sub>N</sub> ig]<sub>A</sub>.

There are also words derived from two words which together are *not* a compound, for instance *veelwifverij* 'polygamy', and *driewieler* 'tricycle'. Compounds such as \**veelwif* and \**driewiel* do not exist in Dutch, and neither do derivations such as \**wifverij* and \**wieler*. Both words are therefore structured as follows: [ [veel]<sub>A</sub> [wif]<sub>N</sub> erij]<sub>N</sub>, and [ [drie]<sub>Num</sub> [wiel]<sub>N</sub> er]<sub>N</sub>. Such derivations are called synthetic compounds.

The class of synthetic compounds also contains a large number of formations based on combinations of words of the type discussed in section 5, such as *toegeven*, *aankomen*, and *waarnemen*, where the second member is a verb. Let us take as an example *toegeeflijk* 'lenient'. *Toe* and *geef* in combination are not a word. Therefore the structure of *toegeeflijk* can again be represented as [ [toe]<sub>Prt</sub> [geef]<sub>V</sub> lijk]<sub>A</sub>. Within *toegeeflijk* main stress is on the verbal part *-geef-*: *toe'geeflijk*. In the word combination *toegeef* on the other hand, main stress is on the particle *toe*. Examples of the same type are, for instance, *aan'trekkelijk* 'appealing', next to *'aan-trekken* 'to appeal', *toe'passelijk* 'applicable', next to *'toepassen* 'to apply', and *uit'drukkelijk* 'explicit', next to *'uitdrukken* 'to express'. Evidently, *-lijk* in synthetic compounds attracts stress. This is not something to be surprised at: we have already seen above that *-lijk*, just as *-isch* and *-zaam* belongs to the second category of suffixes, which cause a rightward shift in stress in the words they attach to. Also *-isch* and *-zaam* occur in synthetic compounds, and just as in the case of *-lijk* main stress is on the rightmost stressable vowel preceding the suffix: *nieuw'modisch* 'modern', *oudtesta'mentisch* 'Old-Testamentary', *mede'deelzaam* 'informative', *op'merkzaam* 'attentive'. Synthetic compounds on *-ig* and *-erig* show the same picture of hesitation between categories (2) and (3) as we have observed above for formations on these suffixes derived from *one*, possibly compound, word. Thus, we find *'kromnervig* 'hook-veined', next to *rond'borstig* 'frank', and *'tweeradig* 'two-wheeled', next to *dik'blad-erig* 'thick-leaved'.

Given this, it is striking that within synthetic compounds some suffixes attract stress which do not show this behaviour elsewhere. Most spectacular in this is the suffix *-baar*. There is no retraction when *-baar* is suffixed to one word, as shown by *be'invloedbaar* 'influenceable', next to *be'invloeden* 'to influence'; *be'klemtoonbaar* 'stressable', next to *be'klemtonen* 'to stress'; *be'voordeelbaar* 'favourable', next to *be'voordelen* 'to favour'; *ver'antwoordbaar* 'justifiable', next to *ver'antwoorden* 'to account for'; *ver'oordeelbaar* 'condemnable', next to *ver'oordelen* 'to condemn'; and

*ver'waarloosbaar* 'negligable', next to *ver'waarlozen* 'to neglect'. In *-baar* derivations not based on *one* word, when in other words the *-baar* derivation is a synthetic compound, there is always stress retraction, as in *af'zetbaar* 'removable', next to *'afzetten* 'to remove', *om'koopbaar* 'bribeable', next to *'omkopen* 'to bribe'; *over'draagbaar* 'transferable', next to *'overdragen* 'to transfer'; and *waar'neembaar* 'observable', next to *'waarnemen* 'to observe'. In these last cases the base of the derivation is a separable verb. Thus, within synthetic compounds *-baar* behaves, just as *-lijk*, as a suffix of the second category. In all other cases, *-baar* behaves, just as *-aar*, as a suffix of the third category. The number of synthetic compounds in *-baar* so much exceeds the number of other diagnostically relevant derivations in *-baar* (in which the suffix is preceded by two or more stressable vowels) that *-baar* in all relevant descriptions of Dutch known to us is characterized without reservation as a suffix of the type *-lijk*.

The suffix *-end* behaves in very much the same way. In words from *one* other word we find stress retraction *only* in *wan'hopend* 'desperate', next to *'wanhopen* 'to despair', and *wan'trouwend* 'suspicious', next to *'wantrouwen* 'to distrust'. In other cases, we never find stress retraction when the derivation is made on the basis of *one* word only. Examples: *'antwoordend* 'answering', next to *'antwoorden* 'to answer'; *'arbeidend* 'working', next to *'arbeiden* 'to work'; *be'voordelend* 'beneficial', next to *be'voordelen* 'to favour'; *'oordelend* 'judging', next to *'oordelen* 'to judge'; and *ver'waarlozend* 'neglecting', next to *ver'waarlozen* 'to neglect'. Stress retraction does occur, however, in derivations in *-end* based on combinations of words, for instance *neer'buigend* 'condescending', next to *'neerbuigen* 'to bend down'; *op'lettend* 'attentive', next to *'oplekken* 'to attend'; *terug'houdend* 'reserved', next to *'terughouden* 'to hold back'; *uit'muntend* 'excellent', next to *'uitmunten* 'to excel'; and *uit'stekend* 'excellent', next to *'uitsteken* 'to protrude'. Most of these synthetic compounds are, moreover, characterized not only by their semantic idiosyncrasies, but also by their ability to serve as a base for comparative and superlative formations, and formations on *-heid*, for instance *neerbuigender*, *neerbuigendst*, *neerbuigendheid* 'being condescending'. Other formations in *-end* lack this morphological valence. Beside synthetic compounds in *-end*, formed on the basis of a particle + verb combination, we find, parenthetically, also formations on the basis of a combination of adverb or noun + verb. Here stress retraction occurs as well: *eens'luidend* 'in conformity' next to *'eens luiden* 'to conform', and *doel'treffend* 'effective', next to *'doel tref-fen* 'to score'.

Also in synthetic compounds ending in *-s* the rightmost stressable vowel

before the suffix often receives main stress, for instance in *goed'lachs* 'quick to laugh', *klein'steeds* 'provincial', *buiten'beens* 'side-slip-ish', and *groot'scheeps* 'ambitious'. Opposite to these, we have *'grofdraads* 'coarse-threaded', and *'negenmaands* 'nine-monthly'. Stress retraction before -s, however, never occurs in derivations on the basis of just *one* word, for instance *'buitenlands* 'foreign', and *'Oostenrijks* 'Austrian'.

Finally, stress retraction occasionally occurs in synthetic compounds ending in nominalizing suffixes. In such cases, the suffix is immediately preceded by a verbal component. Thus, Kruyskamp 1976 gives in *-heid*: *afge'scheidenheid* 'separateness', next to *'afgescheiden* 'separate', *inge'nomenheid* 'satisfaction', next to *'ingenomen* 'pleased', *opge'smuktheid* 'showiness', next to *'opgesmukt* 'showy', *opge'zwellenheid* 'being swollen', next to *'opgezwellen* 'swollen'.<sup>8</sup> In these cases, the effect of stress rule (8) is explicitly contradicted.

In summary: within synthetic compounds we find a clear tendency to shift stress rightwards, to the rightmost stressable vowel before the suffix, especially so when the synthetic compound is an adjective, and at the same time the suffix is immediately preceded by a verbal component. In this manner synthetic compounds provide independent support for the hypothesis that the accentuation of derived Dutch words must be described in terms of word classes rather than boundaries.

## 7

Since 1968 the idea has settled that 'both the placement of main stress and the stress contours within the word and the phrase are largely predictable from the syntactic and the nonprosodic phonological structure of an utterance by means of a transformational cycle' (Chomsky and Halle 1968: 59-60). In this, the following factors may play a part:

- (1) The nature of one of more segments occurring within the unit implied; for instance, for vowels the value of the feature [ $\pm$  tense], and the number of consonants (zero, one, or more) present in a certain position within the word;
- (2) The syntactic class of the implied unit, for instance A, V, N, or NP;
- (3) The nature of the boundaries within the implied unit, for instance + or #;
- (4) An idiosyncratic classification of the lexicon in terms of non-phonetic features such as [ $\pm$  Foreign].



It has been our purpose here to demonstrate that as regards the accentuation of derived Dutch words syntactic classification is more significant than the nature of the internal boundaries. In particular, we conclude that evidence is lacking for the view that some suffixes must be preceded, and some prefixes must be followed, by boundaries other than +.

### Notes

- <sup>1</sup> We omit from discussion a presently irrelevant third type.
- <sup>2</sup> Booij (1975: 6) does not demonstrate that the 'independent argument' for this distinction adduced by him cannot be accounted for through the usual rules of assimilation – perhaps in interaction with rules of accentuation and syllabification – of Dutch.
- <sup>3</sup> Here, as below, we give the accentuation of adjectives as occurring in the non-contrastive predicative function.
- <sup>4</sup> Cf. Van den Berg 1970: 6-15.
- <sup>5</sup> 'In woorden van uitheemse oorsprong gaat juist het rythmisch nevenaksent aan het sterke aksent vooraf, en zij worden dan door een of meer zwakke syllaben gescheiden.'
- <sup>6</sup> Cf. Kiparsky 1966: 96 fn. 10.
- <sup>7</sup> In the latter case Bloomfield (1950: 209) speaks of '*Derived primary words*, containing more than one bound form'.
- <sup>8</sup> In a handful of cases one finds stress retraction also in nominalizations based on just one word. For *-heid* this behaviour is typical when attached to a particular group of adjectives ending in *-loos*, as in *moede'loosheid* 'dejection', next to *'moede-loos* 'dejected', *ouder'loosheid* 'orphanhood', next to *'ouderloos* 'parentless', *smake-loosheid* 'tastelessness', next to *'smakeloos* 'tasteless', *teugel'loosheid* 'unrestrainedness', next to *'teugelloos* 'unrestrained', and *voorkeur'loosheid* 'being without preference', next to *'voorkeurloos* 'without preference'.

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# INFLECTIONAL ASPECTS OF ADJECTIVES IN THE DIALECTS OF DUTCH-SPEAKING BELGIUM\*

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## *1. Introduction*

Until the very recent past the field of linguistics was characterized by, among other things, a deep mistrust and a general lack of mutual appreciation between 'dialectologists' on the one hand, and 'general linguists' on the other. It was not until the last few years that a distinct change in attitude on both sides — fortunately — became noticeable. Nowadays only a handful of linguists remain to be convinced of the fact that dialect research is meaningless unless it is placed within the framework of a general theory of language and linguistic change. At the same time, the general process of theory formation can benefit from the findings of dialect research, both monotypical and diatopical. One might indeed justifiably regard every dialect as a natural language (even less subject to stereotypification than standard languages). This being true, monotypical studies give far more interesting information for the confirmation or falsification of hypotheses on the grammars of natural languages. Up to now, TG linguists have turned — with surprisingly naive greed — to all kinds of exotic languages to set up these grammars. With regard to the relevance of diatopical studies, the reader is reminded here of the famous maxim of the first German dialectographers: 'aus dem räumlichem Nebeneinander ein zeitliches Nacheinander'; in other words: dialects can cast a revealing light on the hows and whys of language change.

The purpose of this paper is to illustrate this fruitful interaction of general theory (-formation) and (monotypical and diatopical) dialect research through adjective inflection in the dialects of Dutch-speaking Belgium. At this moment, my research may not yet have led to any detailed alternatives to the general (TG) theory; the fascinating aspect of this

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limited subject is that it confronts us 'live' with the most controversial topics in generative (morpho)phonology: the function of the lexicon (5.1.), the abstractness conditions on underlying representations (4.1, 4.2.), the problem of rule ordering (4.3., 5.3.), simplification of the system by creating a more 'natural' rule context as a possible target of linguistic change (3.).

After an exploration in general terms of the subject-matter of this paper (section 2.), the inflection of attributive adjectives will be discussed in three stages: masculine singular (section 3.), neuter singular (section 4.), and feminine singular + general plural (section 5.)

## 2. Some general remarks on inflection

As there is no inflection of any kind in Dutch in the predicative use of the adjective, a discussion of inflection in attributively used adjectives will suffice. In this respect one has to distinguish four types: masculine singular (m), feminine singular (f), neuter singular (n), and the plural of the three genders (pl).

One can assume the following underlying suffixes for the entire Southern Dutch area:

- |                |     |
|----------------|-----|
| (1) masculine: | -ən |
| feminine:      | -ə  |
| neuter:        | -∅  |
| plural:        | -ə  |

Several things are worth noting in this paradigm.

(i) As regards the underlying suffixal forms, the most remarkable difference between the North and the South is to be found in the neuter: north of the rivers Rhine and Meuse (the classic 'Great Divide' between the Northern and Southern Netherlands) one finds after a definite determiner or pronoun a *ə*-suffix (alternating with *∅*); in the South *-ə* does not occur,<sup>1</sup> for example:

- |                         |                        |                    |
|-------------------------|------------------------|--------------------|
| (2) North               | South                  |                    |
| <i>het sterke paard</i> | <i>het sterk paard</i> | 'the strong horse' |
| <i>ons nieuwe huis</i>  | <i>ons nieuw huis</i>  | 'our new house'    |
| <i>een sterk paard</i>  | <i>een sterk paard</i> | 'a strong horse'   |

Historically this difference stems from the morphological opposition of 'strong' (suffix *-∅*) vs. 'weak' (suffix *-ə*) inflection.<sup>2</sup> As early as the

Middle Dutch period there was a tendency towards the assimilation of the adjective suffix to the preceding pronoun or determiner. This resulted in an extension of strong inflection (to the detriment of its weak counterpart), which at the same time implied a simplification of the system. In Northern Dutch the  $-ə/-\emptyset$  alternation in the neuter is the only relic of the historical opposition of strong vs. weak inflection; in Southern Dutch this opposition has disappeared altogether.<sup>3</sup>

(ii) While the feminine and plural have historically different suffixes, it is, when viewed synchronically, remarkable how the two cases act identically in southern dialects. This in spite of the fact that precisely here one finds both locally and geographically the most subtly conditioned alternations (i.e.  $-ə$  or  $\emptyset$ ). This seems to indicate that the possible change from  $-ə$  to  $\emptyset$  cannot be very old historically, and that the (synchronic) change is phonologically rather than morphologically conditioned. This explains the uniform underlying feminine and plural suffix form  $-ə$ . Below we shall take a more detailed look at the suffixes of (1) above.

### *3. Masculine singular (m)*

Throughout the Dutch-speaking area one may assume  $-ən$ <sup>4</sup> as the basic suffix form, cf. *een/ne grōt[ən] aap* 'a big monkey'. This also holds true for dialects that have no linking  $-n$  between auslaut  $-ə$  and the anlaut vowel of the subsequent noun.<sup>5</sup>

It would be plausible to expect this suffix form to be pronounced  $-ə$  in the 'classic'  $-n$  apocope areas (roughly speaking Brabant, the south-west excepted, Limburg, and a few scattered areas in Flanders: Ghent, Hulst, Temse and Rupelmonde in the Waasland, and a small area in north-western French Flanders<sup>6</sup>), and to be pronounced  $-ən$  outside the apocope areas.

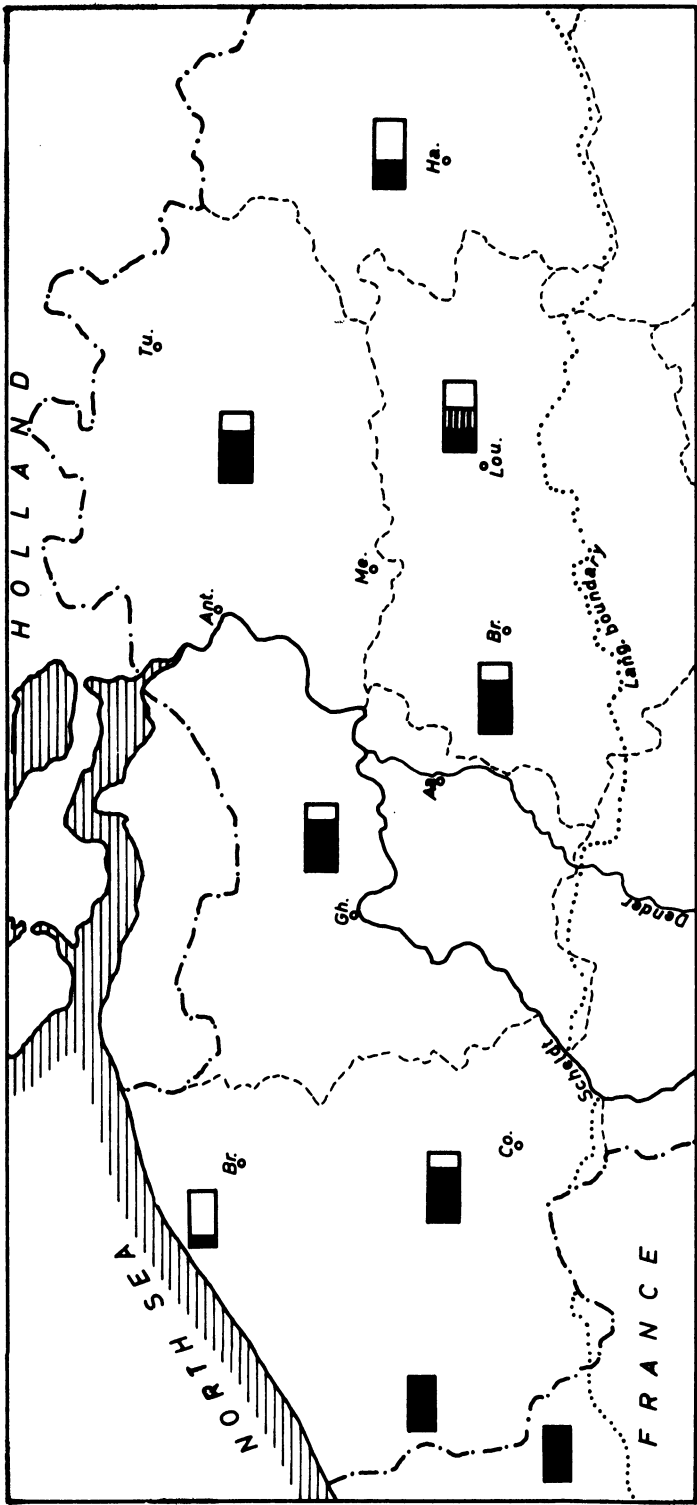
In fact, however, the situation is quite different as Map 1 shows (p. 226).

Thus, one finds a uniform  $-ən/-ə$  alternation in Antwerp, West-Brabant,<sup>7</sup> eastern Flanders and the major part of western Flanders (i.e. more than two-thirds of the Southern Netherlands).

The decisive distributional factor for the choice of either  $-ə$  or  $-ən$  is formed by the initial segment of the subsequent noun:

- $-ən$  before *t, d, b, h*,<sup>8</sup> and *V*,
- $-ə$  elsewhere.

For example:



① Adjective: inflectional ending (masc. sg.)

- |   |                                 |  |                    |
|---|---------------------------------|--|--------------------|
|    | always -en                      |  | -en / t, d, (h), V |
|    | -en / t, d, b, (h), V           |  | -en / V            |
|  | -en / t, d, (h), V<br>opt. b, r |  |                    |

(3) <i>nən dikkən tak</i>	'a thick branch'
<i>nə langən dag</i>	'a long day'
<i>nən (h)ogən berg</i>	'a high mountain'
<i>nə wildən (h)ond</i>	'a wild dog'
<i>nə grotən aap</i>	'a big monkey'
<i>nə langə stok</i>	'a long stick'
<i>nə vuilə pot</i>	'a dirty pot'
<i>nə jongə lijster</i>	'a young thrush'
<i>nə frissə wind</i>	'a fresh breeze'

In view of this a few interesting questions come to mind.

(i) What determines the naturalness of the 'class' of segments consisting of  $\langle t, d, b, h \rangle$ ? For it is exactly this naturalness that might explain the alternation.

(ii) Does or does not such an unnatural rule context indicate a (highly unstable) system-in-change? Normally speaking, it would, the more so if one regards simplification of the system (and consequently the rules of that system, too) as one of the aims of language change. However, what does one find? This system shows a remarkable stability, both in space (cf. the large area) and in time!<sup>9</sup>

Only in the extreme West and East of the Southern Netherlands do somewhat more natural rule contexts for the  $-ən/-ə$  alternation occur: Limburg:<sup>10</sup>

- $-ən$  before  $t, d, h, V$
- $-ə$  elsewhere

the northern coastal area of western Flanders:<sup>11</sup>

- $-ən$  before  $V$
- $-ə$  elsewhere

In French Flanders and the extreme West of Flanders, the alternation does not even exist at all:<sup>12</sup>  $-ən$  occurs in all positions. It is at this moment difficult to trace whether these occurrences are simplifications of the Flemish-Brabant rule as regards its context. As far back as a century (cf. Willems' dialect material) the same situation was observed. Synchronically there are no indications as to the expansiveness of these simpler and more natural systems!

Generally speaking it is possible to attribute the tenacious survival of the adjectival inflectional  $-ən$  (m) to the need for expressing the opposition of this element to (f)  $-ə$ . The distinctions between the genders are after all determined in the *lexicon*. As a consequence, the above example is

a supporting argument for the following hypothesis: *the fact that a functional opposition or alternation (on a morphophonological level) is lexically determined adds to the consolidation and conservation of that opposition or alternation.*

#### 4. Neuter singular (n)

In the neuter singular, the dialects of the Southern Netherlands show no suffix whatsoever. However, this is not to say that the adjective formation is a-suffixal.

Below, two morphophonological alternations of the adjectival basic morpheme will be discussed, where the conclusion in both cases will be that the alternation cannot be adequately explained synchronically if one does not posit a zero suffix  $-\emptyset$  for the (n)-form.

This, of course, is a very serious step, since it is exactly opposed to the rather basic constraints which have been placed on underlying representations in recent years. For, as such zero suffixes are never realised (directly), what is introduced here is in fact a case of 'absolute neutralization'.<sup>13</sup> However, this is far from saying, of course, that we would generally opt against an optimally *natural* representation.

4.1. In the dialect area in Flanders that has no  $-\partial$  apocope,<sup>14</sup> one finds several dozens monomorphemic adjectives ending in  $-\partial$ , for example *dikke* 'fat', *dunne* 'thin', *trage* 'slow', *diepe* 'deep', *verre* 'distant'. Normally one would expect, in attributive use of these adjectives, the following paradigm:

(4)	(m)	$-\partial n$	<i>nen dikkən tak</i>	'a thick branch'
	(f)	$-\partial$	<i>een dikkə vrouw</i>	'a fat woman'
	(n)	$-\partial$	<i>een dikkə stro</i>	'a thick straw'
	(pl)	$-\partial$	<i>dikkə takken</i>	'thick branches'

However, in fact (n) has a form without  $-\partial$ : for example, *een dik stro* 'a thick straw', *een ver land* 'a distant land'. So in this case 'flection' occurs together with apocope of stem  $-\partial$ !

The occurrence of this phenomenon is far from isolated, cf.



- (5) *mānə* (*maan*) 'moon' - *māntjə* (*maantje*) 'moon' (dim.)  
*dīpə* (*diep*) 'deep' - *dīpst* (*diepst*) 'deepest'  
*diptə* (*diepte*) 'depth'

Apparently in all three cases the following (morphophonological) TRUNCATION rule operates:

- (6)  $\text{auslaut } -ə \longrightarrow \emptyset \quad / \text{ ——— +suffix}$

The apocope of  $-ə$  in (n) adjectives (cf. *hij is dikke* 'he is fat', but *een dik paard* 'a fat horse') can only be explained, and integrated into the theory by means of rule (6). However, this implies the introduction of a zero suffix. Any other way it would become a purely lexical matter, which it evidently is not.

Apart from all this, there is a supplementary *functional* explanation of the apocope of  $-ə$  in (n) adjectives: apocope is the primary means to express the (lexical) difference in gender of (f) and (n), cf. *een dik+ə koe* 'a fat cow' vs. *een dik+∅ paard* 'a fat horse'.

4.2. Especially in Flanders and (roughly) the northern half of Antwerp (see Map 2 p. 230), the adjectives with underlying  $/\bar{V} + d/$  (e.g. *kwaad* 'angry', *rood* 'red', *dood* 'dead', *oud* 'old', *koud* 'cold')<sup>15</sup> show a remarkable alternation: used predicatively (without a suffix) they end in  $-[t]$  (by final devoicing of  $/d/$ ); used attributively in neuter singular (with no realized suffix) they end in  $\bar{V}$  or  $\bar{V} + j/w$ .

For example:

- (7) *hij is kwaad[t]* 'he is angry' - *een kwaad(j) wijf* 'an angry woman'  
*het is ou[t]* 'it is old' - *ou(w) bier* 'stale beer'

This seems to indicate a rule of the following type:

- (8) 
$$\begin{array}{c} d \swarrow \searrow \\ \emptyset \quad j/w \end{array} \quad / \quad \bar{V} \text{ ——— } +$$

Historically the final  $-d$  modifications in (n) adjectives (e.g. *doo(j)* = *dood* 'dead') might be explained by analogy with other inflectional forms such as (m) *doo(j)ən* and (f) + (pl) *doo(j)ə*, or even as a reflex of a former presence of  $-ə$  (i.e. from weak inflection) but, if viewed synchronically, it seems that we are dealing here with the same process as in other inflectional categories in basic morphemes ending in  $\bar{V} + d$ , cf. *laa(j)ən* (<*laaden* 'to load'), *roo(j)ər* (<*rooder* 'redder'), *doo(j)ə* (<*doode* 'dead'). In other words:  $d \rightarrow \emptyset$  or  $j/w$  after a long vowel and before a suffix that is not con-



sonantal, especially in anlaut position. This in its turn implies that a zero suffix<sup>16</sup> is posited for (n) adjectives, for instance:

(9) /# $\bar{a}d + \emptyset \# b\bar{i}r \#$ / becomes:

[ $a.^w bi:r$ ] = *oud bier* 'stale beer'

Above we have made an attempt to situate the *-d* modifications geographically. They were called (roughly speaking) Flemish and northern Brabantish;<sup>17</sup> in the more southern regions of Brabant and the eastern Flemish Dender district, only the adjective *goed* 'good' shows a more or less analogous alternation (cf. [ $gu: bi:r$ ] = *goed bier* 'good beer'). However, one should bear in mind that in this area *goed* even in predicative use can have a *d*-less form (e.g. *dat bier is goe/goed* 'that beer is good').

As far as *-d* modification is concerned, in Flanders itself a distinction will have to be made between:<sup>18</sup>

(a) the Waasland and a vertical (North-South) strip west of the river Dender:

/  $\bar{V}$ \_\_\_\_ +  $\emptyset \# C \dots$   
cf. *rood zand* 'red sand' becomes *roo[s]and*  
next to: *een roo[d]èm* 'a red shirt'

(b) otherwise in Flanders:

/  $\bar{V}$ \_\_\_\_ +  $\emptyset \# \dots$   
cf. *roo(j) zand*  
next to: *een roo(j) èmde*

Thus, one can speak in a way of a 'Staffellandschaft'.

4.3. The alternation discussed in the previous section is not only interesting with regard to the abstractness controversy (or, more accurately, the reality of a zero suffix). It also touches, and rather spectacularly so, on the discussion concerning *rule ordering*.<sup>19</sup>

In Flemish, generally speaking the following two rules can apply to sequences such as /# $r\bar{o}d + \emptyset \# z\bar{a}nd \#$ / 'red sand'.

(i) The well-known devoicing rule operating on fricatives:

(10) [ $\begin{smallmatrix} -son \\ +cont \end{smallmatrix}$ ]  $\rightarrow$  [-voice] / [-son] \_\_\_\_

cf. *rood* [s]and

and (ii) the rule of D-DELETION discussed above:

(11)  $d \rightarrow \emptyset / \bar{V} \_\_\_\_ + \emptyset \#$

cf. *roo*ϕ *zand*

It is worth noting here that the (10) > (11) order is counterbleeding. Now what do the current propositions<sup>20</sup> with regard to intrinsic rule ordering predict? They predict either simultaneous application of both rules, or application in the order (10) > (11), which in both cases renders *roo* [s]and!!

What in fact happens, however, is that the vast Flemish area falls apart in two sections (cf. Map 2). French Flanders and the larger part of western Flanders show *roo* [z]and, *goe* [v]olk 'good folks', etc., but elsewhere the more plausible *roo* [s]and, *goe* [f]olk, etc. are found. This opposition is easily explained if one considers it to be the result of two different application orders of rules (10) and (11):

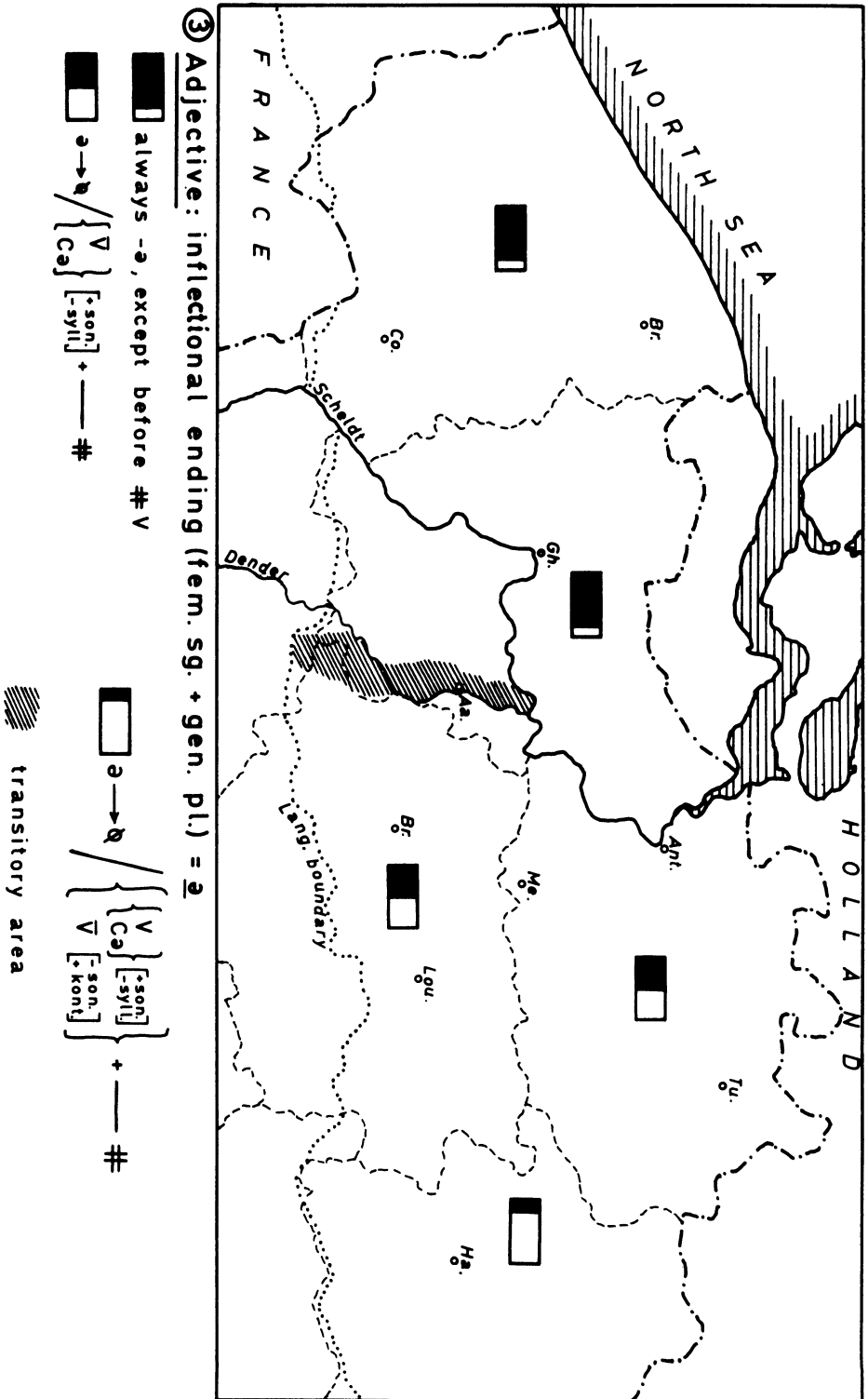
(12)	#rōd + ∅ #zǎnd #	
	(11) rō zǎnd	(10) rōd sǎnd
	(10) -	(11) rō sǎnd
	roo [z]and	roo [s]and
	(West)	(East)

These facts appear to be incompatible with any theory of purely (or entirely) intrinsic rule ordering. It is, however, possible via Koutsoudas' (1976) hypothesis of simultaneous rule application to predict that the eastern area (with *roo* [s]and as the result of the simultaneous application of rules (10) and (11)) is expansive to the detriment of the western area with its 'unnatural' rule order (11) > (10).

### 5. Feminine singular (f) and general plural (pl)

It seems reasonable to posit a basic suffixal form /ə/ in the entire area of the Southern Netherlands. On the systematic phonetic level, however, this area is to be regarded as a 'Staffellandschaft', in that the suffixal -ə is reduced more and more towards the East. *Grosso modo* one can distinguish three main areas,<sup>21</sup> as displayed in Map 3.

(i) Flanders (with the exception of the Dender district);<sup>22</sup> Here, suffixal



- (16) *een vol fles* 'a full bottle'      - *vol flessen* 'full bottles'  
       *een stom vraag* 'a stupid question' - *stom vragen* 'stupid questions'  
       *een stijf kraag* 'a stiff collar'    - *stijf kragen* 'stiff collars'

In the case of Brabant and Limburg, this rather rough sketch needs elaboration in a number of ways.

### 5.1. *Brabant*

The abovementioned rule has a facultative character in that forms with  $\sim\sigma$  (e.g. *een vuilə kat*) are scaled somewhere between the extremes 'impossible' and 'common usage'; they are not sanctioned but have a low frequency of usage. This frequency, however, does increase inversely proportional to the stereotypification of the combination *adj. + noun*, for example *een schoon vrouw* > *een schoon deur* 'a beautiful door', or rather *een schone deur* > *een schone vrouw*. This factor of 'stereotypification' is even more apparent in the adjective *half*, which is just outside the rule context:<sup>25</sup> in the combinations *half maan* 'ceiling-mop' and *half deur* 'stable door',  $\sigma$ -less forms are common usage. Used in combination with *pint* 'pint', one finds both *half* and *halve*, and in the highly coincidental combination *een halve kast* 'a half cupboard',  $\sigma$ -less forms are all but non-existent.

The common usage of the combinations *half deur* and *half maan* is clearly connected with the extreme stereotypification of these combinations. They are even halfway through the process of becoming compounds (cf. standard *groenvink* 'green finch', *hoogstraat* 'high street', etc.). Prosodically, however, they still follow the pattern of substantive groups (both the adjective and the noun carry primary stress).

It is evident that such a pragmatico-semantic conditioning of the morphophonological process is hard to integrate into a formal grammar: even lexical features fail miserably here!

The transition from the 'Flemish' area to that of 'Brabant' is quite abrupt in the North (with the river Scheldt as its boundary), but more gradual in the South (i.e. south of Dendermondt). In this transitional area (the Dender district),  $\sigma$ -APOCOPE has an even more facultative character. Here, also, the role of stereotypification is of even greater importance. The dialect of Aalst<sup>26</sup> is typically transitional.

### 5.2. *Limburg*

In Limburg the rule of  $\sigma$ -APOCOPE stands on firmer ground than it does in Brabant. It not only has a wider rule context; it is also less dependent on the presence or absence of the factor of stereotypification.

Here the distinction between (f) / (pl) forms on the one hand, and (n) forms on the other has not disappeared: (f) / (pl) have 'stoottoon' ('jerky'

pronunciation), whereas (n) forms have 'sleeptoon' ('slurred' pronunciation).<sup>27</sup> For example:<sup>28</sup>

- (17) (f.) *een* [vól] *maag* 'a full stomach'  
 vs. (n.) *een* [vòl] *bakje* 'a full bowl'

(f.) *een* wé.rəm *maand* 'a warm month'  
 vs. (n.) *een* wè.rəm *nest* 'a warm nest'

(f.) *een* wé.is *vrouw* 'a wise woman'  
 vs. (n.) *een* wè.is *kind* 'a wise child'

This opposition of tones simultaneously explains why morphophonological  $\partial$ -APOCOPE is so firmly established in Limburg: it has a functional explanation.

5.3. Generally speaking, in the recent literature on the (internal) applicational order of morphophonologically and phonologically conditioned rules, the prevailing view is that the former usually apply before the latter. Some linguists (a.o. Goyvaerts (1975) ) do not even hesitate to call this a binding principle. In order to find out how all this relates to the Brabant/Limburg rule of  $\partial$ -APOCOPE, it is necessary to compare this rule with a number of Brabant/Limburg phonological rules.

(i) In a relatively large area of southern Brabant (see Map 4 below), the following phonological rules apply to underlying  $\bar{a}$  + w:

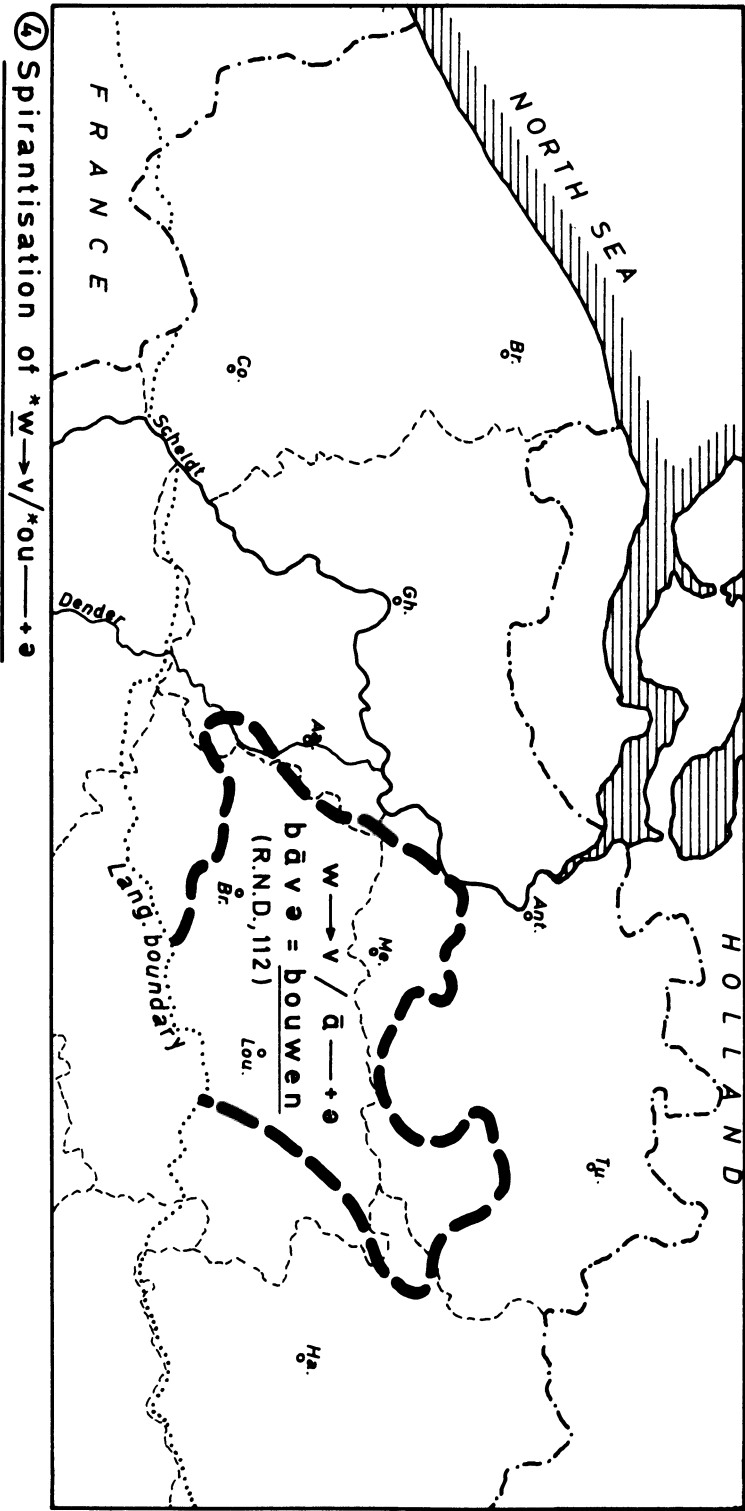
- (18)  $w \rightarrow v / \bar{a} \text{ \_\_\_\_\_\_ } (+)\partial$  SPIRANTIZATION  
 e.g. [vra:və] 'women'  
 [ba:və] 'to build'  
*nen* [fla:və] 'an insipid. . .'

- (19)  $w \rightarrow \emptyset / \bar{a} \text{ \_\_\_\_\_\_ } \#$  W-DELETION  
 e.g. [vra:] 'woman'  
 [ba:] 'building'  
 [fla:] 'insipid'

From alternations such as *ne(n)* [fla:və] (m.) - (*een*) [fla:] (f) + (pl), one may infer that the rule of  $\partial$ -APOCOPE does indeed apply before both (18) and (19),<sup>29</sup> thereby confirming the current hypothesis.

(ii) Yet, there are more examples of low-level phonological rules that must precede the APOCOPE rule in such a way that they are in a feeding relation, cf.:





(a) the epenthesis rule introducing the so-called svarabhakti-vowel between a postvocalic liquid and a non-coronal consonantal segment, e.g. [kaləm] = *kalm* 'calm', [wɛ.rəm] = *warm* 'warm', [ɛ.rəm] = *arm* 'poor', cf. the rule context for ə-APOCOPE in Brabant and Limburg. The derivational chain of *warne* (f) + (pl) thus becomes:

*wɛrm*+ə → *wɛrəmə* → *wɛrəm*

(b) The rule deleting *d* between postvocalic N or L<sup>30</sup> and (suffixal) ə (e.g. *rōnd*+ə → *rōnə* = *ronde* 'round', *wild*+ə → *wilə* = *wilde* 'wild', which in Limburg adapts these adjectives for ə-DELETION in (f) and (pl): *rōnd*+ə → *rōnə* → *rōn*, e.g.

een	[ron flɛs]	'a round bottle'	and
	[ron flɛsə]	'round bottles'	

vs.

(m.) ne(n)	[ronə pɔt]	'a round jug'
(n.) een	[ront stɪk]	'a round piece'

(c) The rule deleting *g* between postvocalic *ŋ* and suffixal ə,<sup>31</sup> e.g. *lāng*+ə → *lāŋə* 'long', which in Limburg adapts these adjectives for the input of ə-APOCOPE: *lāng*+ə → *lāŋə* → *lāŋ*.

e.g.	een	[laŋ la.t]	'a long lath'
		[laŋ la.tə]	'long laths'

vs.

(m.) ne(n)	[laŋən da:χ]	'a long day'
(n.) een	[la:ŋk stɪk]	'a long piece'

(iii) With a view to rule ordering, however, the most surprising element was found in Colinet's highly accurate study of the dialect of Aalst (1896). On p. 125 he emphatically notes that the well-known rule of *n*-ASSIMILATION:

$$(20) \quad n \rightarrow \begin{bmatrix} \alpha lab \\ \beta cor \\ \gamma back \end{bmatrix} / \text{---} \begin{bmatrix} C \\ \alpha lab \\ \beta cor \\ \gamma back \end{bmatrix}$$

does not apply to the -*n* in auslaut after application of ə-APOCOPE. Thus:

- (21) (i) #gr̄yn+ə # b̄uəm+ən # (=groene bomen 'green trees')
- ↓
- ∅
- [gr̄y:n bu.əmən]
- (ii) #gr̄yn+∅ # b̄uəm+əkə # (=groen boompje 'little green tree')
- ↓
- m
- [gr̄y:m bu.əməkə]

And similarly:

- een [sxuən vra:] = *een schone vrouw* 'a beautiful woman'
- vs. een [sxu.əm vent̄n] = *een schoon ventje* 'a beautiful lad'

A scrutiny of several Brabant dialects rendered roughly the same results, which is all the more surprising since one's intuitive idea of *-n* assimilation (in Dutch dialects and perhaps even universally) is that it must be very low-level and obligatory.<sup>32</sup> With respect to this, the question crops up of how all this can be accounted for in a generative-phonological description of these dialects.

Those who adhere to the (over)powerful means of a strictly linear extrinsic rule ordering might be able to save their case formally by having the assimilation rule operate *before* the (morphophonological) apocope rule. Those who opt (and rightly so) for intrinsic rule ordering according to a limited number of universal principles will benefit poorly from the current proposals.

For a correct understanding of this matter, the major relevant proposals are summarized under three headings:

(i) *Kiparsky* (1968a, 1971, 1973)

1968a: 'Rules tend to shift into the order which allows their fullest utilization in the grammar.'

1971: 'Rules tend to be ordered so as to become maximally transparent.', where:

a rule (P)  $A \rightarrow B/C - D$  is 'opaque' (reverse: 'transparent') in that one still finds systematic-phonetic forms of the type:

(i) A in the context C - D

(ii) B in a context different from C - D

(iii) B which is not the result of process (P) (e.g. underlying) in the context C - D

(ii) *Kisseberth* (1972a, 1972b, 1973)

(P1) 'Whenever possible, a rule  $R_i$  is applied in the sequence that will leave no surface structures that satisfy the structural description of  $R_i$ .'

(P2) ' $R_i$  is not applied if there exists some other rule  $R_j$  whose subsequent application destroys the structural configuration that induces  $R_i$ .'

(iii) *Koutsoudas-Sanders-Noll* (1974):

'The natural situation for a rule is to apply (possibly simultaneously with other rules) wherever its structural description is met.'

With mutually bleeding order the principle of 'proper inclusion precedence' (PIP) holds: 'For any representation  $R$ , which meets the structural description of each of two rules  $A$  and  $B$ ,  $A$  takes applicational precedence over  $B$  with respect to  $R$  if and only if the structural description of  $A$  properly includes the structural description of  $B$ .'

We shall confront our (Southern) Dutch assimilation rule and the Brabant/Limburg rule of  $\partial$ -APOCOPE with each of the above proposals.

ad (i):

The order assimilation > apocope (cf. above) is counterfeeding, and therefore unnatural (Kiparsky 1968a). Moreover the assimilation rule is 'opaque' in that one finds forms with un-assimilated  $-n$  (Kiparsky 1971, principle (i)).

ad (ii):

The Brabant situation is a blatant violation of (P1) if one takes the assimilation rule as  $R_i$ .

ad (iii):

Application of the rules, when their structural descriptions are met leads to an observationally inadequate grammar.

In order to save the principle of intrinsic rule ordering, one might theoretically consider lexical marking of the adjectives ending in  $\bar{V} + n$  (*bruin* 'brown', *schuin* 'slanted', *groen* 'green', *klein* 'small', *fijn* 'fine', etc.) as exceptions to the assimilation rule. There is a snag, however, in that these adjectives are exceptions in (f) and (pl), but not in (n),

cf.	[ <i>klān bu.əmə</i> ]	'small trees'
	[ <i>klām buməkə</i> ]	'little tree'

Therefore one would have to lexically mark the inflectional forms (f) and (pl) rather than the morphemes as such, which as far as we can see is quite impossible. If in our description we wish to preserve the status of the assimilation rule we have intuitively attributed to it (i.e. a low-level P-rule), there appears to be as yet only one solution: an appeal to the

notion of *global constraint*.<sup>33</sup> In that case, the assimilation rule is formulated as follows:

$$(20^1) \quad n \rightarrow \begin{bmatrix} \alpha lab \\ \beta cor \\ \gamma back \end{bmatrix} / \text{---} \left\{ \begin{matrix} + \\ \# \end{matrix} \right\} \begin{bmatrix} C \\ \alpha lab \\ \beta cor \\ \gamma back \end{bmatrix}$$

*Condition:* the input *-n* has not become word-final through application of *ə-APOCOPE*.<sup>34</sup>

The only somewhat unelegant aspect of this solution is that which can be held against 'global constraints' at all times: it represents a tremendous addition to the power of grammars.

6. As was said in the introductory section of this paper, the main purpose of this contribution was to give an illustration of the fruitful interaction that *can* and *must* exist between the general theory and (monotopical and diatopical) dialect study. The section on adjective inflection in the dialects of the Southern Netherlands has confronted us intensively with the most controversial topics of generative (morpho)phonology; again, and in many ways, the concrete analysis of the facts has proved to be a true challenge to the theory.

### Notes

<sup>1</sup> This opposition was charted by Daan (1969) on the basis of R.N.D. data, sentence nr. 126: *ons oud(e) huis is afgebrand* 'our old house burnt down'.

<sup>2</sup> Historical data regarding adjective inflection, especially in Van Loey (1969, 1970); Peters (1937) gives the first geographic survey.

<sup>3</sup> Synchronically, however, there remain indications of a historical *-ə*; cf. also 4.2.

<sup>4</sup> Historically this is an accusative + dative form; in the process of simplification, the nominative adopted this form.

<sup>5</sup> Especially in (certain) Brabant dialects a linking *-n* can be inserted between auslaut *-ə* (suffixal or non-suffixal), and anlaut vowel, e.g. *die bendə[n] is nie' te vertrouwen* 'that gang is not to be trusted', or *grotə[n] en kleine* 'large and small'. In connection with this, cf. Goemans (1931, p. 73).

<sup>6</sup> Cf. Hol (1947), Blancquaert-Tavernier (1944), Ryckeboer (1975), and the Taal-atlas (vol. 5, Map 3). Some examples of *n-APOCOPE*:

(pl) *lampə* 'lamps', *ratə* 'rats'  
(inf) *eetə* 'to eat', *bakə* 'to bake'

<sup>7</sup> The dialects of the more eastern part of Brabant show a slightly different rule context:

*-ən* before *t, d, (h), V* (obl)  
*b, r* (opt)  
*-ə* elsewhere

Vis-à-vis this, cf. Goemans (1901) for the dialect of Louvain, and Pauwels (1958) for the dialect of Aarschot.

<sup>8</sup> This holds true only, of course, for the eastern area without *H-PROCOPE*, which was charted in Van Ginneken (1932) and Grootaers (1942).

<sup>9</sup> A number of Flemish and Brabant dialects were checked against the rather voluminous dialect material in Willems (appr. 1885). A century ago, the situation was just as 'wacky' as it is now!

<sup>10</sup> Cf. Grootaers (1907, p. 290ff) for the dialect of Tongeren, and Grootaers and Grauls (1930) for the dialect of Hasselt.

<sup>11</sup> This is not entirely unexpected: the so-called 'ingwaëonic' dialects were generally characterized by a greater morphological (especially inflectional) simplicity (cf. English).

<sup>12</sup> This area can be roughly defined by means of R.N.D. sentence nr. 95: *een koele kelder is goed voor 't bier* 'a cool cellar is good for beer'.

<sup>13</sup> Vis-à-vis the abstractness controversy, cf. Kiparsky (1968b, 1973), Brame (1972), Crothers-Shibatani (1975), Schane (1974) Goyvaerts (1975), and Hooper (1978).

<sup>14</sup> Cf. Weijnen (1966), and Taeldeman (1978).

Some examples: Flemish <i>bellə</i> 'bell'	-	Brabantish <i>bel</i>
<i>nekkə</i> 'neck'	-	<i>nek</i>
<i>zoetə</i> 'sweet'	-	<i>zoet</i>

<sup>15</sup> In the dialects of Brabant and neighbouring eastern Flanders (cf. De Schutter, 1968), one finds the additional adjectives *blaud* (=blauw 'blue') and *graud* (=grauw 'grey'): cf. [*bla:t*] (not inflected) - [*bla:və*] (m.sg.) - [*bla:*] (f. sg.+gen.pl.), and [*a:t*] - [*a:və*] - [*a:*] (=oud/oude 'old'). The final -*d* can be called hypercorrect and is in fact the result of inversion (cf. Zonneveld's paper in this volume),

$$d \rightarrow \left\{ \begin{matrix} j/w \\ \emptyset \end{matrix} \right\} / V \_\_ \partial \quad \text{resulting in:}$$

$$\left\{ \begin{matrix} j/w \\ \emptyset \end{matrix} \right\} \rightarrow d / V \_\_ \#$$

This inverted rule caused an increase in the number of *d* vs. *j*, *w*, or  $\emptyset$  alternations, and may indicate a high appreciation of intervocalic *d*-syncope in those dialects.

<sup>16</sup> In our opinion, synchronically one can no longer assume a  $\partial$ -suffix, as the  $\emptyset$ -suffix indicates better and more directly that in attributively used (n) adjectives one never perceives a suffix, but that the language user does indeed regard these forms as having undergone inflection. Moreover, the assumption of a  $\partial$ -suffix would make it impossible to account for the facts mentioned in 4.1. in an insightful and generalizing way.

<sup>17</sup> Cf. De Bont (1962, p. 393) for the dialect of Northern Brabant Oerle.

<sup>18</sup> Cf. Map 2.

<sup>19</sup> A clear survey of the problematic nature of rule ordering in generative phonology is presented in Sommerstein (1977), which the reader is referred to for an explanation of the terminology used here.

<sup>20</sup> Cf. Kiparsky (1971), Koutsoudas, Sanders, and Noll (1974), and particularly Koutsoudas (1976), discussed exhaustively in Trommelen and Zonneveld (1978).

<sup>21</sup> Cf. Map 3. The lack of illustrative material hampered a clear definition of the boundaries considerably.

<sup>22</sup> Cf. Bouchery (1907), Teirlinck (1924), and Van Sint-Jan (1930).

<sup>23</sup> Local variation is not altogether impossible, cf. the monographs of Colinet

(1896), Goemans (1901), Smout (1905), Mazereel (1931), and Pauwels (1958). In Northern Brabant Oerle, the same situation is found, according to De Bont (1962).

<sup>24</sup> Again, local variation is not entirely impossible; cf. the monographs of Grootaers (1907), Grootaers and Grauls (1930), and Goossens (1959). According to Elemans (1969), about the same situation holds true for the dialect of eastern Brabant Huiseling.

<sup>25</sup> *Half* 'half' (phon. [(h)aləf]) ends in  $-C\emptyset \begin{bmatrix} -\text{son} \\ +\text{cont} \end{bmatrix}$ ; according to the rule context, the final sequence should be  $-C\emptyset \begin{bmatrix} +\text{son} \\ -\text{syll} \end{bmatrix}$

<sup>26</sup> Cf. Colinet (1896).

<sup>27</sup> In connection with the Limburg tone-phenomenon, cf. Leenen (1952), Grootaers (1921, 1949), Stevens (1955), and Goossens (1959). Apocope of  $-\emptyset$  in Limburg usually went together with the development of a 'stoottoon'.

<sup>28</sup> Adopted with I.P.A. transcription form Goossens (1959).

<sup>29</sup> Viz.	#flāw+ən #	#flāw+ə #
ə-APOCOPE:	-	flāw
rule (18)	flāvə(ŋ)	-
rule (19)	-	flā

<sup>30</sup> Especially in Limburg, cf. the examples in Goossens (1959).

<sup>31</sup> This rule is in fact entirely analogous to the rule mentioned in the preceding paragraph but geographically it is applied in a wider area.

<sup>32</sup> For Southern Netherlandic dialects, we might even introduce it as a 'surface phonetic constraint' (SPC), if it were not for those few (predictable) 'exceptions'.

<sup>33</sup> Vis-à-vis this, cf. Kenstowicz and Kisseberth (1970), Kisseberth (1973), and Kenstowicz (1973); Goyvaerts (1975) takes a disapproving stand against derivational constraints.

<sup>34</sup> Some phonologists would not accept this type of 'derivational constraint'; e.g. according to Kiparsky (1973), and Sommerstein (1977) a rule can only look back on the underlying representation, but not, as the case is here, on a previous rule.

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# SOME THEORETICAL IMPLICATIONS OF STEM ALTERNATIONS IN DUTCH DIMINUTIVES AND PLURALS\*

PETER TIERSMA

## *1. Introduction*

The processes of pluralization and diminution in Dutch account for some of the more interesting problems in Dutch phonology. This paper will concern itself only tangentially with the question of which diminutive and plural suffixes are added to specific stems, the formulation of which is in itself somewhat problematic. Rather, it will concentrate on accounting for the stem changes which may be associated with the affixation of one or both of the abovementioned suffixes, and it will attempt to find a theoretical framework which will make it possible to account for these stem changes in a natural, intuitively satisfying way. As such, this paper is a further justification and elaboration of the concept of *relational rules* in phonology, as first laid out in Tiersma (1978), and the concomitant *disjunctive lexical representations* of, for example, Hudson (1974) and Hooper (1976).

## *2. Short-long vowel alternations*

### *2.1. Vowel alternations in noun plurals*

A number of high-frequency nouns in Dutch have a short vowel in the singular where the plural has a long vowel. Some examples of this alternation follow:<sup>1</sup>

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(1)	singular		plural		gloss
a.	<i>gat</i>	[χɑt]	<i>gaten</i>	[χa:tə]	hole
	<i>dak</i>	[dɑk]	<i>daken</i>	[da:kə]	roof
	<i>glas</i>	[χlɑs]	<i>glazen</i>	[χla:zə]	glass
	<i>bad</i>	[bat]	<i>baden</i>	[ba:də]	bath
	<i>pad</i>	[pɑt]	<i>paden</i>	[pa:də]	path
b.	<i>god</i>	[χɔt]	<i>goden</i>	[χo:də]	god
	<i>lot</i>	[lɔt]	<i>loten</i>	[lo:tə]	lot
	<i>hof</i>	[hɔf]	<i>hoven</i>	[ho:və]	court
c.	<i>gebrek</i>	[χəbrɛk]	<i>gebreken</i>	[χəbre:kə]	lack
	<i>spel</i>	[spɛl]	<i>spelen</i>	[spe:lə]	game
	<i>weg</i>	[wɛχ]	<i>wegen</i>	[we:γə]	way
d.	<i>schip</i>	[sxɪp]	<i>schepen</i>	[sxɛ:pə]	ship
	<i>lid</i>	[lɪt]	<i>leden</i>	[le:də]	member
	<i>smid</i>	[smɪt]	<i>smeden</i>	[sme:də]	smith
e.	<i>stad</i>	[stɑt]	<i>steden</i>	[ste:də]	city

The alternation between *stad* and *steden* in (e) is the sole example of that type known to me, and will hence be considered suppletive. In what follows, we will be concerned primarily with the types of alternations exhibited in (a-d). A rule to account for these alternations would have to have roughly the following form (with the short vowel considered underlying, due to the neutralization of *I* and *E* to *e*):

$$\text{Rule 1: } \left\{ \begin{array}{c} \alpha \\ \text{ɔ} \\ \{\varepsilon\} \\ \{I\} \end{array} \right\} \longrightarrow \left\{ \begin{array}{c} a: \\ o: \\ e: \end{array} \right\} \quad / \text{ --- } C + \text{ə}\#$$

This rule does not operate on the majority of Dutch nouns whose stem has one of the above short vowels, nor are all plural nouns with long stem vowels derived from singulars with a short vowel, as the following examples illustrate:

(2)	singular		plural		gloss
a.	<i>kat</i>	[kɑt]	<i>katten</i>	[kɑtə]	cat
	<i>rat</i>	[rɑt]	<i>ratten</i>	[rɑtə]	rat
	<i>bos</i>	[bɔs]	<i>bossen</i>	[bɔsə]	forest
	<i>bed</i>	[bɛt]	<i>bedden</i>	[bɛdə]	bed
	<i>lip</i>	[lɪp]	<i>lippen</i>	[lɪpə]	lip

b. <i>maat</i>	[ma:t]	<i>maten</i>	[ma:tə]	measure
<i>baas</i>	[ba:s]	<i>bazen</i>	[ba:zə]	boss
<i>goot</i>	[χo:t]	<i>goten</i>	[χo:tə]	gutter
<i>reep</i>	[re:p]	<i>repen</i>	[re:pə]	bar

One way to deal with the irregular application of Rule 1 is to replicate the historical process which led to the alternation in the first place. In Dutch, as in many Germanic languages, short vowels were lengthened in open syllables. Based on Van Loey (1960), it is possible to reconstruct the rough phonetic values of the Middle Dutch word *dach* 'day', which exhibits this alternation:

(3)	<i>singular</i>	<i>plural</i>
nominative	<i>daχ</i>	<i>da:γə</i>
genitive	<i>da:γəs</i>	<i>da:γə</i>
dative	<i>da:γə</i>	<i>da:γən</i>
accusative	<i>daχ</i>	<i>da:γə</i>

Synchronically, underlying geminates could be used to prevent the words in (2a) from undergoing lengthening. Lexical items such as *kat* would have to have the underlying representation /katt/, while *dak*, which must be allowed to undergo the alternation, would be represented in deep structure as /dak/. The rule of lengthening would then apply only to words which contain a vowel followed underlyingly by a single consonant. However, because the geminates needed to have this rule work correctly would all have to be deleted by an across-the-board rule of degemination (a type of absolute neutralization, at least in spirit), this type of analysis is excluded by the principles of Kiparsky (1973).

Since the rule is no longer truly phonetically conditioned, and since there is for that reason no way to determine which morphemes undergo the process and which do not, Rule 1 can best be considered a minor rule of the language, lexical items which are subject to it being marked [+ Rule 1]. This also provides a natural account for the fact that many lexical items which once underwent the rule (in some form) have lost the diacritic and now have short vowels both in the singular and in the plural, for example, *bisschop* 'bishop', *lek* 'leak', *gemak* 'comfort', and *straf* 'penalty' (Schönfeld 1959:30).

## 2.2. Vowel alternations in diminutives

Up to this point, Rule 1, the rule of vowel lengthening, has appeared to be a fairly typical type of morphophonemic rule. An added twist is given to

this process, however, by the alternations which the stem undergoes in the diminutive. It should be noted in this regard that, aside from a few lexical items which resist diminution due to their semantic content, the affixation of the diminutive suffix is a fully productive process which affects virtually all Dutch nouns. In addition, the diminuted noun is often more common than its simple correspondent, and in some cases may differ semantically from the simple noun in unsystematic ways.

Many of the words such as those in (1) have a long vowel in the diminutive form:<sup>2</sup>

(4)	<i>singular</i>	<i>plural</i>	<i>dim. sg.</i>	<i>dim. pl.</i>	<i>gloss</i>
	<i>glas</i> [α]	<i>glazen</i> [a:]	<i>glaasje</i> [a:]	<i>glaasjes</i>	glass
	<i>slag</i>	<i>slagen</i>	<i>slaagje</i>	<i>slaagjes</i>	blow
	<i>vat</i>	<i>vaten</i>	<i>vaatje</i>	<i>vaatjes</i>	barrel
	<i>lot</i>	<i>loten</i>	<i>lootje</i>	<i>lootjes</i>	lot
	<i>schip</i>	<i>schepen</i>	<i>scheepje</i>	<i>scheepjes</i>	ship

In order to deal with this, it is necessary to extend Rule 1 to include diminutives:<sup>3</sup>

$$\text{Rule 1' } \left\{ \begin{array}{c} \alpha \\ \mathfrak{c} \\ \varepsilon \\ I \end{array} \right\} \longrightarrow \left\{ \begin{array}{c} a: \\ o: \\ e: \end{array} \right\} \quad / \text{ --- } C \left\{ \begin{array}{c} +\mathfrak{c}\# \\ \# \mathfrak{c}(s)\# \end{array} \right\} \begin{array}{l} (a) \\ (b) \end{array}$$

This rule is, of course, a minor rule, as was the earlier version. Hence all forms such as *glas*, *slag*, *lot*, etc., which have a long vowel in both the plural and the diminutive, would have to be specifically marked as undergoing Rule 1'.

What complicates this analysis is that not all diminutive forms of nouns with vowel alternations in the simple stem can be derived in this way. There is a class of words such as those in (1) which forms the diminutive on the basis of the *singular* stem (the one with the short vowel), as is shown below:

(5)	<i>singular</i>	<i>plural</i>	<i>dim. sg.</i>	<i>dim. pl.</i>	<i>gloss</i>
	<i>bad</i> [α]	<i>baden</i> [a:]	<i>badje</i> [α]	<i>badjes</i>	bath
	<i>graf</i>	<i>graven</i>	<i>grafje</i>	<i>grafjes</i>	grave
	<i>god</i>	<i>goden</i>	<i>godje</i>	<i>godjes</i>	god
	<i>hof</i>	<i>hoven</i>	<i>hofje</i>	<i>hofjes</i>	court

<i>spel</i>	<i>spelen</i>	<i>spelletje</i>	<i>spelletjes</i>	game
<i>weg</i>	<i>wegen</i>	<i>weggetje</i>	<i>weggetjes</i>	way
<i>smid</i>	<i>smeden</i>	<i>smidje</i>	<i>smidjes</i>	smith

What is interesting about these forms is that they undergo Rule 1' in environment *a* but not in *b*. Therefore words such as *bad* are only subject to Rule 1a, while *glas* must be made to undergo both subparts of the rule. In order to eliminate needless duplication, the following redundancy rule can be formulated:

RR 1:            [+ Rule 1b]             $\longrightarrow$     [+ Rule 1a]

This expresses the generalization that if the diminutive has a lengthened stem vowel, the plural will also.

But the above does not exhaust the possibilities for diminutive formation. There is a small number of words for which the Van Dale dictionary (Kruyskamp, 1976) lists a diminutive with a short vowel in the singular, which alternates with a long vowel in the diminutive plural:

(6)	<i>singular</i>	<i>plural</i>	<i>dim. sg.</i>	<i>dim. pl.</i>	<i>gloss</i>
	<i>dak</i> [α]	<i>daken</i> [a:]	<i>dakje</i> [α]	<i>daakjes</i> [a:]	roof
	<i>lid</i>	<i>leden</i>	<i>lidje</i>	<i>leedjes</i>	member
	<i>dag</i>	<i>dagen</i>	<i>dagje</i>	<i>daagjes</i>	day

To account for the forms in (6), Rule 1' must be revised as follows:

Rule 1'':

$$V \longrightarrow V: \quad / \text{ } \underline{\hspace{1cm}} C \quad \left\{ \begin{array}{l} + \partial \# \\ \# j \partial (s) \# \\ \# j \partial s \# \end{array} \right\} \begin{array}{l} a. \\ b. \\ c. \end{array}$$

Once again, a redundancy statement is needed to the effect that if a diminutive plural is lengthened, the simple plural is also:

RR 2:            [+ Rule 1c]  $\longrightarrow$  [+ Rule 1a]

The final rule to account for the lengthening in both the simple plural and in diminutives is Rule 1''. Note that, in comparison to Rule 1, which dealt only with plurals, Rule 1'' is a complex rule, and that this complexity is caused by the diminutives of very few nouns (I have only been able to find eleven). For this small number of diminutives, a standard Generative treatment requires two different rule features besides that needed for the plural, plus two redundancy statements. This is a very high cost for some eleven or so forms.

The alternative to generating these diminutives by a mechanism similar to that described above is to simply enter them into the lexicon, a measure proposed in Van den Berg (1974:73). This would make much of the excess baggage attached to Rule 1'' unnecessary. In addition, a rule such as 1'' is notationally equivalent to lexicalization, since it expresses no real generalizations about Dutch. In essence, the rule feature [+ Rule 1c] makes no insightful statement concerning how Rule 1'' operates, and is ultimately no more complex than listing diminutive forms with lengthened vowels in the lexicon, as is done in dictionaries of Dutch.

The proposal to lexicalize these forms is supported by the presence of doublets for a number of these diminutives, with or without difference in meaning. Thus Van Dale indicates that *dagje(s)* and *daagje(s)* have different meanings for some speakers.<sup>4</sup> Similarly, *gat* 'hole' has the diminutive *gaatje(s)* 'small hole' and *gatje(s)* 'small buttocks'. *Padje(s)* and *paadje(s)* apparently alternate without semantic variation, although there are probably dialectal differences. And while *slotje(s)* is the normal diminutive of *slot* according to Van Dale, *slootje(s)* may also be used in the sense of 'lock' only. If the diminutive forms are not lexicalized, then it would be virtually impossible to account for these meaning differences. The only alternative for Generative theory is to propose that phonological features are attached to bundles of semantic features, but this clearly goes beyond the present theory, and is in essence a less elegant way of admitting that these forms must be taken up in the lexicon.

### 3. -er stems

#### 3.1. -er stems diachronically

Another stem change which may take place in the environment of the plural or diminutive is the suffixation of *-er* to the stem before the plural or diminutive marker is added, as the examples in (7) illustrate:

(7)	<i>singular</i>	<i>plural</i>	<i>gloss</i>
	<i>ei</i>	<i>eieren</i>	egg
	<i>hoen</i>	<i>hoenderen (-ers)</i>	hen
	<i>kalf</i>	<i>kalveren</i>	calf
	<i>lam</i>	<i>lammeren</i>	lamb
	<i>lied</i>	<i>liederen</i>	song

There are probably some ten to fifteen nouns which take the *-eren* plural.

These would, like the nouns with vowel alternations, have to be marked in some way.

Historically, the forms in (7), like the English *children*, are double plurals, as the corresponding words in Middle Dutch testify:

(8)	<i>singular</i>	<i>plural</i>
	<i>ei</i>	<i>eier</i>
	<i>hoen</i>	<i>hoender</i>
	<i>kalf</i>	<i>kalver</i>
	<i>lam</i>	<i>lammer</i>
	<i>lied</i>	<i>lieder</i>

For Middle Dutch we therefore need a morphological rule such as the following:

$$\text{Rule 2: } \left[ \begin{array}{l} +\text{plural} \\ +A \end{array} \right] \longrightarrow \text{er \#}$$

where all nouns with the *-er* plural would be marked as part of the conjugation class A. Thus *kind* would be marked [+A], which would then cause it to undergo Rule 2 in the plural and become the Middle Dutch *kinder*.

Subsequently, the form *kinder* was no longer felt to be a true plural, and the plural suffix *-en* was added to all of these forms, resulting in *kinderen* and the other plurals given in (7).<sup>5</sup> Note that this creates some problems for a Generative approach to language change. Such an approach can only have a single underlying form in the lexicon for the Middle Dutch *kind-kinder* alternation. Thus *kind* would have to be entered into the lexicon with a pluralization rule (Rule 2) being used to generate the plural *kinder*. Since the standard theory must deal with *kinder* as the base form *kind* plus the plural morpheme *-er*, it cannot cope with the fact that *kinder* was at some stage in the language no longer felt to be composed of a stem plus plural suffix. But only when *kinder* is considered to be monomorphemic is it possible to explain why speakers found it necessary to add an additional (productive) plural suffix, resulting in *kinderen*. This goes against the grain of one of the central tenets of Generative Phonology – that when there is a generalization to be made on the basis of a surface alternation in the language, be it ever so humble, such a generalization must be expressed in the generative rules of the language. What true Generative phonologist would, on the basis of singular-plural alternations such as *ei-eier*, *kalf-kalver*, *lam-lammer*, *rund-runder*, *goed-goeder*, *rad-rader*, *telch-telger*, *lied-lieder*, *kleed-kleder*, *blad-blader*, *hoen-hoender*,



*gelid-geleder*, *gemoed-gemoeder*, and a few others, ignore Rule 2 and consider the alternations suppletive, i.e., enter both alternants into the lexicon? Who would miss such a generalization? The standard theory must generate the *er* plural (which demands that the speaker be aware that this is a plural marker), while at the same time maintaining that this *er* is no longer felt to be a plural, but rather has become part of the stem.

An analysis which at a certain stage allows the lexicon to contain multiple stems such as *ei/eier* and *kind/kinder*, etc., can better deal with this restructuring. What must have taken place is that at some point in the history of the language, the *er* plural was not generated, i.e., was not predictable on the basis of independently motivated criteria. Within this theory, that would mean that rather than identifying the nouns with *er* plurals by means of diacritics attached to a base morpheme (as suggested above), both forms would have to be entered into the lexicon, since the generative rule which derived the plural from an underlying morpheme was no longer operative. While the specifics are rather vague, it is clear that at a later stage, the internal composition of plurals such as *eier* and *kinder* was lost, and they became essentially monomorphemic, much as the English words *cactus*, *colloquium*, *oxen*, and *children* must be regarded as monomorphemic for many speakers. Possibly a morphological parsing rule which identified *er*# as a plural morpheme disappeared, resulting in plurality being associated with the entire plural form, or with a  $\emptyset$  marker. Needless to say, this situation quickly led to a 'real' plural marker being affixed to these forms. Crucial to this discussion is the observation that in a standard treatment, loss of a generative rule of *er*-suffixation should lead to all of the forms with *er* plurals disappearing, a prediction which is obviously not borne out.

A treatment of this problem which analyzes *kinder* as *kind* plus the plural morpheme *er* cannot explain why another, productive, plural morpheme was *added* to the exisitant plural marker, rather than replacing it. Substitution of an unproductive plural marker with a productive one is well-attested in the history of Dutch; addition of a second plural marker is virtually unique. Only an approach where *kinder* as a whole can be entered into the lexicon is able to deal with this in a natural way.

An analysis with multiple stems such as *ei/eier*, *kind/kinder*, etc., can also better account for subsequent developments in the language. Specifically, there are a number of forms for which the *er* stem was used as the basis for restructuring. The Dutch words *spaander* 'chip' and *lover* 'foliage' were originally the plural forms of *spaan* and *loof*, but now all four exist as separate lexical items. And in Afrikaans, which developed from eight-

eenth century Dutch, the word for 'egg' is *eier* (Standard Dutch *ei*, plural *eieren*), and the word for 'hen' is *hoender* (Standard Dutch *hoen*, plural *hoenderen* or *hoenders*).<sup>6</sup> In an analysis where *er* is considered the plural morpheme, or part of the plural morpheme, the restructuring of the stem plus plural into the new singular is highly problematic.

### 3.2. *-er* stems synchronically

The alternation in (7) would, at first glance, appear to justify a synchronic pluralization rule which shows the reanalyzed 'double plural':

Rule 3:        [+plural] ———> *eren* #

As in the case of Middle Dutch, morphemes which are pluralized in this way would have to be so marked in the lexicon in a Generative treatment. There are at least two considerations which militate against this type of analysis, however. The first is that if speakers of Middle Dutch did not generate the *er* plural, it is even less likely, given the fact that the number and proportion of these plurals has decreased, that *-eren* is used synchronically to generate plural forms. The second consideration is that if *kinderen* is to be parsed into morphemes, one can argue that the division should be *kinder+en* rather than *kind+eren*. This is indicated by the large number of compound nouns based on the stem with *er*, some examples of which follow:<sup>7</sup>

(9) compound	gloss	components
<i>kinderwagen</i>	baby carriage	<i>kinder</i> + <i>wagen</i> 'wagon'
<i>kinderachtig</i>	child-like	<i>kinder</i> + <i>achtig</i> 'like'
<i>kinderspeeltuin</i>	childrens' playground	<i>kinder</i> + <i>speeltuin</i> 'playground'

In addition, the diminutives of these nouns support the concept of multiple stems like /kind/ and /kinder/:

(10)	singular	plural	dim. sg.	dim. pl.	gloss
	<i>ei</i>	<i>eieren</i>	<i>eitje</i>	<i>eitjes</i> <i>eiertjes</i>	egg
	<i>hoen</i>	<i>hoenderen</i>	<i>hoentje</i>	<i>hoentjes</i> <i>hoendertjes</i>	hen
	<i>kalf</i>	<i>kalveren</i>	<i>kalfje</i>	<i>kalfjes</i> <i>kalvertjes</i>	calf

<i>blad</i>	<i>bladen</i>	<i>blaadje</i>	<i>blaadjjes</i>	sheet
	<i>bladeren</i>		<i>bladertjes</i>	leaf
<i>rad</i>	<i>raderen</i>	<i>radje</i>	<i>radjes</i>	wheel
		<i>raadje</i>	<i>raadjes</i>	
		<i>radertje</i>	<i>radertjes</i>	
<i>lied</i>	<i>liederen</i>	<i>liedje</i>	<i>liedjes</i>	song
			(but: * <i>liedertjes</i> )	

From the above, we note that there are the following possibilities: (a) the singular stem can be used to form the diminutive; (b) the plural stem can be used to form the diminutive; (c) the singular stem is used for the diminutive singular and the plural stem for the diminutive plural; (d) some combination of the above obtains.

Interestingly, a comparison of this data with that in 2.2 reveals some remarkable similarities between the pattern of short and long vowel alternations and that of the *er* infix. If the alternant with the short vowel is considered equivalent to the stem without *er* (A), while the alternant with the long vowel is equivalent to the stem with *er* (B), the following correspondences emerge:

- (11) a. Where A and B alternate, either in the simple noun or in the diminutive, A appears in the singular and B in the plural.  
 b. The alternation between A and B is receding, with A (the 'unmarked' singular) generally becoming basic, although the paradigm may also be restructured on the basis of B (bidirectional leveling, cf. Tiersma, 1978)  
 c. The diminutive may be formed on the basis of A or B, or may alternate as described in (a).  
 d. The diminutive may be formed with some combination of the possibilities in (c), resulting in doublets, with or without semantic differentiation.

From the above considerations it should be clear that there are some strong arguments to be made that /*kInder*/ should be the underlying form, while there may be equally compelling reasons to insist that the deep structure form should in reality be /*kInd*/. Both analyses have been made in the Generative literature on Dutch phonology, one treatment requiring an *er* augment rule, and the other an *er* deletion rule.<sup>8</sup> The point is that ultimately the decision to choose one alternant over the other as basic is arbitrary, and that phonologists should not be forced to make such unprincipled choices. A multiple stem (or disjunctive) analysis allows one to

do precisely that – to avoid having to make an arbitrary decision, in that this type of representation recognizes *both* alternants as basic.

This type of theory essentially entails that unproductive alternations are dealt with directly in the lexicon, rather than having to ‘generate’ an exceptional form. The remainder of this paper will be devoted to pursuing that approach.

#### 4. *Non-generative rules*

It has been shown in the above that while standard Generative Phonology can derive the correct surface forms for the alternants under discussion, such an approach is roughly equivalent in complexity to an approach in which synchronically unpredictable variants (i.e., whose with *er* or a lengthened vowel) are simply entered as such into the lexicon. Similar notions have been proposed by Hudson (1974), and later by Leben (1978) and Tiersma (1978).

As these proposals have noted, either explicitly or implicitly, standard Generative Phonology has no way of dealing with the subsystematic regularities of items entered into the lexicon, and will therefore go to great lengths to avoid such an analysis. Nonetheless, it is evident that many, if not all, minor alternations are best accounted for lexically. This ties in with the recent claim (e.g., Hooper, 1976) that the generative apparatus is too strong – that it generates variants which are related to one another only historically, an observation which has led to the formulation of a number of means to express this unproductive, historical relationship in a non-generative manner. Examples are the *via-rules* of Vennemann (1972b) and Hooper (1976), the ‘*upside-down*’ rules of Leben and Robinson (1977) and Leben (1978), Hudson’s suppletive analysis (Hudson 1974), and the *relational rules* of Tiersma (1978).

The following analysis will make use of the device of relational rules, refining that concept somewhat, and pointing out the major differences with the other approaches. A relational analysis of a phonological problem requires that non-productive (i.e., non-generative) alternation, as indicated by the non-applicability of a process to nonsense words, borrowings, new formations, etc., be handled with relational rather than generative rules. This entails that such alternant forms be entered into the lexicon. So in the case of [*lɪt*] ‘member’ and its plural [*le:də*], which cannot both be generated from a common underlying form by means of the fully productive phonological and morphological rules of Dutch, the alterna-

tion must be entered into the lexicon. Since the final devoicing of [d] and the utilization of the *en* plural is fully predictable, however, there is no need to lexicalize both words in their surface forms. Hence the underlying representation of the multiple stem is

$\begin{bmatrix} lld \\ le:d \end{bmatrix}$ , written out in full for the sake of clarity. This type of repre-

sentation, which will henceforth be referred to a *multiple stem representation* (also known as disjunctive lexical representation), is equivalent to that posited by Hudson, where the above would be formalized

as  $\begin{bmatrix} l \begin{bmatrix} I \\ e: \end{bmatrix} d \end{bmatrix}$ . Similarly, the alternation *dag-dagen* will have the lexical

representation  $\begin{bmatrix} d\alpha\gamma \\ da:\gamma \end{bmatrix}$ , and *kind-kinderen* will have the representation

$\begin{bmatrix} kInd \\ kInd\partial r \end{bmatrix}$ , which can be abbreviated to  $\begin{bmatrix} kInd \begin{bmatrix} \emptyset \\ \partial r \end{bmatrix} \end{bmatrix}$ , or simply  $[kInd(\partial r)]$

The function of relational rules is to indicate that certain segments alternate in a specific language, without necessarily making claims in terms of directionality, phonetic plausibility, etc. A relational rule indicates that a speaker is or may be aware of a particular type or instance of alternation. In cases such as the noun paradigms above, all speakers of Dutch doubtless are aware of the alternation of certain long and short vowels. On the other hand, it is virtually certain that there are speakers of English who do not realize that *family* and *familiar*, or *stupor* and *stupid* are related to one another. Semantics obviously plays an important role in this regard, and it is for reasons such as these that relational rules are optional.

The relational rules needed to account for the alternations under discussion are the following:

$$(12) \quad \left\{ \begin{array}{c} \alpha \\ I \\ \varepsilon \\ \text{ɔ} \\ \emptyset \end{array} \right\} \longleftrightarrow \left\{ \begin{array}{c} a: \\ e: \\ e: \\ o: \\ \partial r \end{array} \right\}$$

These rules account not only for the lexical alternations of the type given above, but also for derivationally-related words. For example, *kat* 'cat' and *getal* 'number' do not alternate inflectionally with simple plurals which have long vowels, but nonetheless most speakers of Dutch will recognize

the relationship of the first item with *kater* 'tomcat', and that of the latter with the phrase *ten getale* 'in number'. Relational rules also handle nicely the relationship between doublets such as *loof* 'leaves' and *lover* 'foliage'; *spaan* 'chip' and *spaander* 'chip'; *split* 'slit' and *spleet* 'cleft'; *staf* 'staff' and *staaf* 'bar' (examples from Schönfeld 1959). Because of semantic differentiation and the fact that each of the doublets has a separate plural, they have to be full-fledged lexical items. Relational rules provide the means for expressing the relationship between such words without having to generate them from a single underlying form, with all the concomitant *ad hoc* devices needed by such a treatment (a virtually impossible task).

But while relational rules and multiple stems explain in a natural way why restructuring takes place, they cannot by themselves account for certain other subsystematic regularities – for example, those listed in (11) above. Whether or not a particular noun will undergo the alternations expressed by the rules in (12) is highly unpredictable, but when such an alternation occurs, the short vowel or  $\emptyset$  will be in the singular, and the long vowel or *-er* will appear in the plural. This must be expressed by means of a distribution statement such as that below:<sup>9</sup>

$$(13) \quad \text{If } [+ \text{ noun}] \longrightarrow \left\{ \begin{array}{l} \left\{ \begin{array}{l} V \\ \emptyset \end{array} \right\} / [+ \text{ singular}] \\ \left\{ \begin{array}{l} V: \\ \partial r \end{array} \right\} / [- \text{ singular}] \end{array} \right\}$$

A distribution statement of this type, associated with the relational rules in (12), makes it possible to capture the regularity of the *distribution* of the irregular alternations being discussed, while at the same time not having to claim that  $[\alpha]$  becomes  $[a:]$  or that  $[\emptyset]$  becomes  $[\partial r]$ , or vice versa, for some synchronically inexplicable reason and in uncertain environments. In addition, it displays another advantage which no other approach appears to have: it captures the generalization that although the alternations in (12) are idiosyncratic and may have little in common phonetically, they act in essentially identical ways. Thus  $[\alpha]$  relates to  $[a:]$  as  $[\emptyset]$  relates to  $[\partial r]$ . When the alternation is present (although it is not needed), the short vowels and  $[\emptyset]$  are associated with the singular stem, and the long vowels and  $[\partial r]$  with the plural stem. This is a direct consequence of the fact that relational rules (and hence distribution statements) make no crucial claim to phonetic plausibility, enabling the formalism to display the functional unity of phonetically diverse variation by collapsing the alternations into a single statement.

As was noted in (11), there is little pattern in the way these nouns developed the diminutive. This is justly reflected by the fact that no distribution statement can be formulated to cover all of the possibilities. Diminutives with long vowels will simply be entered as such into the lexicon, and those with an alternation between the singular and the plural stem will, like the non-diminuted nouns, have an alternating stem in the lexicon.<sup>10</sup> The presence of multiple stems in simple nouns explains very naturally why some diminutives were formed on the basis of the singular and others on the basis of the plural.

In addition, disjunctive lexical representation accounts very nicely for the existence of doublets. Given Humboldt's Universal (Vennemann, 1972a; Hooper, 1976), which states that 'suppletion is undesirable, uniformity of linguistic symbolism is desirable: both roots and morphemes should be unique and constant', it should be evident that an alternation which must be entered into the lexicon as a multiple stem, such as  $[l \begin{Bmatrix} I \\ e: \end{Bmatrix} d]$  'member', is undesirable in the sense described above. If

nothing else, this type of lexical representation shows very graphically why certain types of leveling occur, since  $[l \begin{Bmatrix} I \\ e: \end{Bmatrix} d]$  is essentially two forms in

an unpredictable relationship to one another, with a single meaning. This provides an additional, unnecessary strain on the memory. The unneeded complexity (two forms associated with one meaning) can logically be resolved in at least two manners. One of these, by far the most common, is to eliminate one of the forms. This is roughly equivalent to what is generally referred to as 'analogical leveling'. The other possibility for resolving the conflict is by the creation of doublets, which involves the association of an additional or different meaning with one of the alternants. Rather than disposing of one of the forms, each alternant takes on word status on its own, and hence once again there is a one-to-one correspondence between sound and meaning. With the single underlying forms of Generative Phonology, such a principle can hardly be invoked; hence within that theory, the creation of doublets and the process of leveling remain essentially unrelated.

### 5. Conclusions

It is not an overstatement to say that for an increasing number of phonologists, what is currently at issue in phonological theory is not *whether* it is

necessary to posit rules to relate lexicalized alternations, but rather *how* this is to be done. While the standard theory can deal synchronically with the stem alternations in Dutch plurals and diminutives, it can do so only at great cost, both in terms of having to employ a complex mechanism to account for the data, and in having to express an extremely unproductive relationship between lexical items by means of synchronically generating them from a common underlying form, an intuitively unsatisfying solution. In addition, Humboldt's Universal allows the theory to explain historical change in a more natural, unitary way.

One of the alternative proposals utilizing non-generative rules is 'Upside-down' Phonology, a revised theory of which is presented in Leben (1978). His proposal attempts to eliminate much of the unnecessary redundancy of the original concept (Leben and Robinson 1977) by listing in the lexicon only words which are idiosyncratic in at least one of their features.<sup>11</sup> Fully productive processes are 'rightside-up' (generative) rules, while non-productive alternation is handled by lexicalizing the variants and relating them to one another by means of 'upside-down' rules. In the case of vowel alternation in Dutch, Leben's version of Upside-down Phonology would be forced to put both [*lɪt*] 'member' and its plural [*le:də*] into the lexicon, since the vowel alternation is not fully predictable. A disadvantage of this theory lies in the fact that these two words are related to one another both by means of an upside-down rule (vowel alternation) and a rightside-up rule (final devoicing). By always entering *words* into the lexicon, a large number of fully productive rules must, in certain cases only, apply in an interpretive rather than generative sense. The multiple stem analysis circumvents this problem by specifying in the lexicon only those segments which cannot be predicted by the fully productive (generative) rules of the language, and hence eliminates this unneeded redundancy.

The Natural Generative Phonology of Hooper (1976) has a rule type (the *via-rule*) which is very similar to relational rules in terms of the claims made concerning it. However, one difference lies in the fact that relational rules need not be marked as applying in any particular case, and therefore here the term *via-rule* is inappropriate. In addition, non-productive morphophonemic alternations are, unlike in Hooper's theory,<sup>12</sup> not considered generative. Rather, these alternants are entered into the lexicon as multiple stems. The theory of relational rules accounts for the similarity between non-productive morphophonemic alternation and suppletion by having both dealt with by the same type of rule, since the alternations tend to be quite similar. For example, the Dutch 'suppletive' alternation in *stad-*



*steden* in (1) is not fundamentally different from the [ɪ]-[e:] alternation, which is probably limited to less than five words, especially in view of the high frequency of the *stad-steden* pair and the large number of derivatives formed on the basis of both alternants. While emphasizing the similarities of processes such as above, this theory also points out the differences between inflectional and derivational alternations by having the former handled by multiple stems with a distribution statement attached to the relational rule.

Ultimately, questions concerning the nature and form of non-generative rules can only be decided empirically, by applying the theories to actual synchronic and diachronic problems. The data presented here supports an approach with both generative and relational rules, where inflectional alternation is handled by means of multiple stems and distribution statements. Not the weakest argument in favor of this approach is the fact that in many ways the theory is a formalization of the criteria used to compile a standard dictionary of the language. Perhaps the lexicographer knows more about underlying forms than he realizes.

### Notes

<sup>1</sup> The forms in this paper, unless explicitly mentioned otherwise, are from the Van Dale dictionary of Dutch. While not as authoritative as the *Woordenboek der Nederlandse Taal*, it is based on it, and the forms are likely to be somewhat more current.

<sup>2</sup> In the rest of this paper I will use standard Dutch orthography, which consistently differentiates long and short vowels. Only long vowels occur in orthographic open syllables (*laten*); and in orthographic closed syllables, long vowels are symbolized by a double vowel grapheme (*laat*), and short vowels by a single grapheme (*katten*, *kat*).

<sup>3</sup> It can be argued that the environment of this rule should be stated in morphological rather than in phonetic terms. Note, however, that [+plural] as a conditioning factor would include the morpheme *s*, which, to my knowledge, never co-occurs with lengthening. Nor does the process seem to occur before any diminutive suffix besides *je*. I am not sure how significant these observations are, however, so for the moment I cannot really favor either analysis.

<sup>4</sup> Frans van Coetsem has pointed out to me (personal communication) that *dagje* and *daagje* occur in different collocations. For example, one can only say *een dagje ouder*, not *\*een daagje ouder*. There are doubtless many other cases where only one of the alternants is appropriate.

<sup>5</sup> In certain dialects and varieties of speech, the *s* plural was added in place of *en* (e.g., *kinders*). A problem for any analysis of this data is the question of *why* the *en* plural was chosen as the productive plural marker, instead of the expected *s* following an unstressed *er*. While I cannot address this problem with certainty, it is interesting to note that Van Loey (1960:17) quotes reanalyzed 'double plurals' such as *kinders* and *clederen* from the first half of the fourteenth century; on the other hand, after

the agentive *-er* suffix, there was at that time still alternation between *s* and *n* plurals in many places – only in the fifteenth century does *n* win out in Brabant. Historically, then, it may not be so strange that the standard dialect of Dutch has *en* following the *er* 'infix'. The fact that the *en* plural has remained strengthens the assertion that irregular plurals of this type must be dealt with in the lexicon, for if they are synchronically generated, the presence of *-eren* instead of (or next to) *-ers* is highly problematic.

<sup>6</sup> These examples are from Schönfeld (1959).

<sup>7</sup> As is generally true in English also, a noun in initial position in Dutch compounds is in the singular or in the genitive, not in the plural. If the *er* were analyzed synchronically as a plural marker, this would make the compounds in (8) very unusual.

<sup>8</sup> A sketch of the literature is given by Jaap van Marle in his unpublished paper 'Tets over de karakterisering van de notie 'mogelijk woord' (1976, Instituut van Neerlandistiek, Universiteit van Amsterdam.)

<sup>9</sup> The basic concept of the distribution statement is taken from Hudson (1974).

<sup>10</sup> This analysis takes the diminutives formed on the basis of the singular stem as productively generated, which is supported by the fact that final voiced consonants in underlying structure are always devoiced before the diminutive suffix in Dutch (as in the singular).

<sup>11</sup> A position not necessarily shared by Robinson.

<sup>12</sup> Hooper seriously discussed Hudson's proposal, however, and later in the book appears to have adopted his approach to some extent.

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EGG, ONION, OUCH!  
ON THE REPRESENTATION OF DUTCH DIPHTHONGS

WIM ZONNEVELD AND MIEKE TROMMELEN

It is hard to read the stubborn attacks on this problem without feeling that since it evidently does not lend itself to a traditional phonemic solution at all, application of an entirely different phonological theory will some day make it evaporate (Shetter, 1972: 1390).

*1. Introduction*

The phonological component of a transformational-generative grammar is defined by a set of (partially) ordered rules which link the underlying phonological representation (ideally the output of the syntactic component of the grammar) to the surface phonetic representation (ideally the set of neural instructions to the speech mechanisms). While logically this linking function of the phonological component could take any form, it was established from the very outset of generative phonology that this form is in fact a very natural one. Generative phonologists expressed this naturalness not, for instance, by limiting the sheer number of rules allowed to appear in any single phonological component - although this is logically a not at all implausible initial hypothesis - but rather by constraining the *types* of rules that could appear in these components. Thus, Postal (1968) proposed that only *maximally general* phonological rules appear in the phonological component of any grammar, by dint of his so-called Naturalness Condition:

- (1) Naturalness Condition: The underlying representation of a form equals its surface phonetic representation, unless one has a reason (a *generalization*) to deviate.

While the Naturalness Condition as such constitutes an enormous limitation on the power of generative phonology, it is also clear that in effect it defines a direction for generative phonological research. Since non-

general phonological rules will be disallowed, generative phonological research will be the study of what constitutes a generalization within the domain of generative phonology. This effect of the Naturalness Condition is reflected directly in the so-called Abstractness Controversy, initiated by Kiparsky (1973a), which has led to several additions to the Naturalness Condition, most notably the Alternation Condition of Kiparsky (1973a), revised in Kiparsky (1973b). This condition removes apparently very general rules of certain types (rules of so-called 'absolute neutralization') from the set of possible generalizations in generative phonology. It will not be our aim, however, to enter in this paper into the discussion on the abstractness conditions on phonological analyses. Rather, the nature of the relation between underlying and phonetic representations within generative phonology has been worded in this introduction in terms of the Naturalness Condition (1) because we intend to discuss here a partial phonological analysis of Dutch, apparently paradoxical in terms of the Naturalness Condition, where the phonetic representation of a small and coherent set of sounds is comparatively irrelevant to phonological analysis. More precisely, we will be concerned here with a set of sounds whose precise phonetic characteristics are complex and to some degree open to debate, while at the same time we will show how phonological analysis of these sounds can be carried out fruitfully in ignorance of and independently of this complexity and debate. Possibly not surprisingly, the set of sounds we will deal with is the set of Dutch diphthongs. In the vein of our aims as expressed above, we will give in section 2 below an overview of the traditional, and more sophisticated phonetic analyses proposed for these diphthongs. In section 3 we will give a brief survey of the various interpretations attached to the Dutch diphthongs by pregenerative structural phonologists, who were, of course, limited comparatively severely in their possible deviations from the phonetic surface. Finally, in section 4 we will carry out an analysis of part of the phonology and morphology of Dutch in order to show that within generative phonology underlying representations of these diphthongs can be arrived at comparatively independently of their phonetic characteristics.

## *2. Phonetics*

A survey of the developing views of the phonetics of the Modern Standard Dutch diphthongs may be subdivided roughly into three periods. The first period runs up to 1940 and includes both the descriptions of the early

pre-1920 impressionistic phoneticians, and the much more detailed experimental studies reported on in Zwaardemaker and Eijkman (1928), Blancquaert (1934), and Eijkman (1937). The second period runs up to 1960 and includes the experimental investigations reported on in Kaiser (1943, 1948, 1950). Finally, the third period comprises the experimental phonetic investigations executed in the sixties at the Instituut voor Perceptie Onderzoek at Eindhoven by Cohen and associates, and at the University of Amsterdam by Mol et al.

With regard to diphthongs, Modern Standard Dutch can be taken as the period starting immediately after the collapse of the three velar diphthongs, first 'auu' and 'au' then 'au' and 'ou'. For all intents and purposes these developments may be situated around or just prior to the turn of the century. Thus, the last grammarian to recommend different pronunciations for 'au' and 'ou' is Den Hertog (1911: 197).

In almost all early phonetic descriptions between 1900 and 1940 the Dutch diphthongs are grouped together in a large class comprising, in their respective spellings, those in (2).

(2)	<i>ieuw</i>	as in	<i>nieuw</i>	'new'
	<i>eeuw</i>		<i>leeuw</i>	'lion'
	<i>uw</i>		<i>duw</i>	'push'
	<i>oei</i>		<i>boei</i>	'buoy'
	<i>ooi</i>		<i>kooi</i>	'cage'
	<i>aai</i>		<i>baai</i>	'bay'
	<i>ei</i>		<i>kei</i> <sup>1</sup>	'boulder'
	<i>ui</i>		<i>lui</i>	'lacy'
	<i>ou</i>		<i>kou</i>	'cold'

As regards a first generalization, as far as we have been able to make out most early analysts agree that these diphthongs consist of two parts, 'two vowels within one syllable', one passing into the other, where the former is strongly articulated, and the latter weakly articulated. They are, therefore, 'falling' diphthongs. Furthermore, in most descriptions these diphthongs are classified as in (3), where the criterion for classification is the frontness (vs. backness) of the second element.

(3)	<i>oei</i>	<i>ieuw</i>
	<i>ooi</i>	<i>eeuw</i>
	<i>aai</i>	<i>uw</i>
	<i>ei</i>	<i>ou</i>
	<i>ui</i>	

Such a classification is presented in one form or other in, for instance, Kruisinga (1913), Roorda (1919), De Froe (1922), Zwaardemaker and Eijkman (1928), Blancquaert (1934), and Eijkman (1937), although Zwaardemaker and Eijkman, in their detailed studies, provide a further classification according to the relative height of the first element, as in (4).

(4)	<i>oei</i>	[ui]	<i>ieuw</i>	[iu]
	<i>ooi</i>	[oi]	<i>eeuw</i>	[eu]
			<i>uw</i>	[yu]
	<i>aai</i>	[ai]	<i>ou</i>	[ɔu]
	<i>ei</i>	[ɛi]		
	<i>ui</i>	[œi] <sup>2</sup>		

The coordinates of the phonetic symbols in (4) can be read from tables in Zwaardemaker and Eijkman (1928: 157) and Eijkman (1937: 77), which may be represented with some presently irrelevant omissions as in (5).

(5)		back	mid	front
	closed	<i>u</i>		<i>y i</i>
	half-closed	<i>o</i>		<i>e</i>
	half-open	<i>ɔ</i>	<i>œ</i>	<i>ɛ</i>
	open		<i>a</i>	

The half-open vowels are relatively short, while the other vowels gain length from top to bottom. The latter all occur independently in non-diphthongic environments as in the words of (6),

(6)	[ <i>buk</i> ]	<i>boek</i>	'book'	[ <i>dif</i> ]	<i>dief</i>	'thief'
	[ <i>bot</i> ]	<i>boot</i>	'boat'	[ <i>bek</i> ]	<i>beek</i>	'brook'
	[ <i>man</i> ]	<i>maan</i>	'moon'	[ <i>ny</i> ]	<i>nu</i>	'now'

while among the half-open vowels [ɔ] and [ɛ] in diphthongs are slightly more open than the vowels occurring independently in Dutch words such as [*pɔt*] *pot* 'pot', and [*mɛt*] *met* 'with'. Finally, [œ] is described in Zwaardemaker and Eijkman (1928: 154-5) as slightly more open than the vowel which occurs independently in a longer version in some loanwords such as *freule* 'lady' [*frœ:lə*], while Eijkman (1937: 74) describes it as slightly more closed than that vowel. The latter part of *ui* is slightly rounded, although heavily so in closed syllables: [*hœys*] *huis* 'house'.

The remaining early descriptions differ from Zwaardemaker and Eijkman's only in detail. Kruisinga, Roorda, De Froe, and Blancquaert simply

describe [ɔ] and [ɛ] in diphthongs as the vowels of *pot* and *met*. There are some subtle differences, however, in the various descriptions of *ui*, with different interpretations as to the height of the first half, and the roundness of the second. Scharpé (1912) gives 'half open followed by non-round' [œj]; Kruisinga (1913) gives 'open followed by non-round' [ɛi]; Roorda (1919) 'mid followed by rounded' [ui]; Muller (1921) 'half open mid followed by non-round' [öi]; De Froe (1922) 'high mid followed by rounded' [öy]; and Blancquaert 'half-open half-long followed by round' [œ.y] (for Blancquaert the first half of these diphthongs is 'half-long'), where none of these authors notes a difference between open and closed syllables.<sup>3</sup> Finally, a comparatively idiosyncratic description (but see below) of *ei*, *ui*, *ou* is given by De Groot (1931a), in particular where he notes that the second halves of these diphthongs will not be necessarily completely 'closed':

- (7) Anfangs ist er dumpf und hat einen mäßig hohen Unterformanten; dann geht er über in einen etwas helleren Klang, nähert sich aber gleichzeitig dem nächstliegenden hellen Vokal der niedersten Unterformantenreihe. Also phonetisch etwa:

$$\begin{array}{lll} ou & = & (\acute{o} \text{ oder } \text{ɔ}) + (o \text{ oder } u) \\ ui & = & \text{œ} + (\phi \text{ oder } y) \\ ei & = & (\varepsilon \text{ oder } E) + (e \text{ oder } i) \end{array} \quad (119).$$

After these 'early' descriptions of the Dutch diphthongs, an extremely detailed 'sociophonetic' study was undertaken by Kaiser and associates in the forties. A report of the study was laid down in Kaiser (1943), and a brief excerpt on diphthongs appeared as Kaiser (1948). Kaiser found by studying oscillograms that within (4) *ei*, *ui*, *ou* can be set off against the others in that the first halves of the diphthongs in the latter group resemble closely the vowels occurring independently as in (6) in their respective formant frequencies, while the deviation from the vowels in *pot*, *freule*, and *met* is much more obvious for the first halves of the former group. As regards the second halves of the diphthongs *ei*, *ui*, *ou*, Kaiser argues that the concern with the quality of this part, as instanced also above, is to some degree exaggerated. In particular she states:

- (8) In the vowels various formative parts are found which, though they are distinguished quantitatively as principal and minor parts, are not looked upon as qualitatively different. On the ground of an extensive examination of the vowels of a few hundreds of Amsterdam under-

graduates it seems correct to distinguish a resonatory component (the lower formative part) and an articulatory component (the higher formative part) in the vowels. The resonatory component is formed in a space of which the pharynx forms a considerable part. . . .

If one examines the articulation of the diphthongs *ei*, *ou*, *ui*, by means of palatograms, then it is surprising how the place of contact on the palate does not remind to the slightest degree of the articulation of the second element, at least if one has to do with unconcerned speakers, for it is quite easy to pronounce the second component intentionally, as mostly happens in declamation.

It seems to me that in the second part of the diphthongs mentioned, exclusively the resonatory component is relevant. Towards the end of the diphthongs one passes over into another, lower, resonatory sound, but does not trouble about the articulatory component. Therefore it is not important whether in the case of *ui* one represents this component as *ie* or as *uu*, for these two have the same resonant component and distinguish themselves exclusively articulatorily, as for the matter of that also *oe* has the same resonant sound. (1948: 303-4)

In 1943:32 Kaiser adds that the change in the resonatory formant in the three diphthongs is from 640 to 320 Herz, figures which will crop up again further on below. Moreover, she finds that for all diphthongs inspection of the relevant oscillograms

- (9) gave the impression that instead of an indefinite number of gradually changing patterns as has been supposed by some phoneticians, two different patterns characteristic for the two parts of the diphthongs are to be recognized. In the majority of cases on the limit of both parts a few vocal periods bear a special character, which usually may not be considered as a simple transition between both principal patterns. The amplitude is smaller than that of either part. Often there are extremely high components visible and probably in connection therewith a high degree of decrement. In a few cases the vocal period became indiscernable. It seems as if a short of hiatus is present (as in a more developed form it is the case between two vowels which are prohibited to form a diphthong, in Dutch occurring only in foreign words). . . .

It happened especially in closed syllables that only two parts were recognizable, each of the three parts but most frequently the last part, being absent now and then. (1943: 32-3)

Thus, for instance for the three words in (10), averages for the three component parts of the respective diphthongs for 27 speakers were roughly as given (in hundredths of a second).



(10) <i>bij</i>	'bee'	[ <i>bɛi</i> ] :	15	2.5	10
<i>vijf</i>	'five'	[ <i>vɛif</i> ] :	10	3	5
<i>baai</i>	'bay'	[ <i>bai</i> ] :	20	3	10

As pointed out by Stutterheim (1962: 31), Kaiser's segmentation of the Dutch diphthongs into three parts has not been an issue in the subsequent research into the subject. For instance, her findings were disregarded completely in the two most important post-war handbooks on Dutch phonetics and (structural) phonology, Van den Berg's *Foniek van het Nederlands* (1959), and Cohen et al.'s *Fonologie van het Nederlands en het Fries* (1959). These works merely provide concise summaries of the pre-war 'early' literature, the latter reiterating in particular Zwaardemaker and Eijkman's results, while the former simply lumps together all views, apparently not worrying whether some of these are mutually compatible at all.

However, in the sixties work done by the IPO-group at Eindhoven and Mol et al. at the University of Amsterdam provided a follow-up to Kaiser's research. The IPO-investigations are reported on in Cohen (1961), Slis and Van Katwijk (1963), 't Hart (1969), and Cohen (1971). In the experiments, the diphthongal characteristics were investigated of the groups of vowels, or of (combinations of) vowel-like sounds in (11).

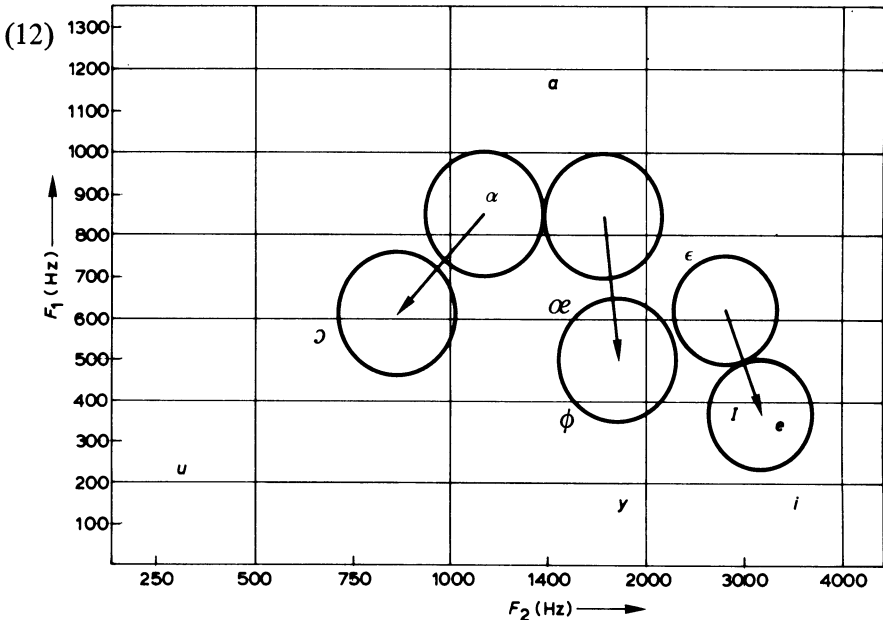
- (11) (i) *ei, ui, ou*  
 (ii) *i, y, u, e, ø, o, a*  
 (iii) *ieuw, eeuw, uw, oei, ooi, aai*

and the results were as follows.

As regards group (i), experiments of several kinds were described. Segmentized stretches of speech of increasing and subsequently decreasing length gave, on listening, for *ei*: 'ε — ε*i* — *i* or *I*', and similarly for the other diphthongs, with no perceivable sound in between the two extremes. Segmentized stretches of natural speech of equal length, shifting through the diphthongs 'from left to right', gave the impression of a gradual change of colour. Synthetic diphthongs consisting of the separate components ε+*i*, α+*y*, and α+*u* gave, upon listening, the impression of acceptable versions of the diphthongs *ei, ui, ou*.

In an experiment described elaborately both in Slis and Van Katwijk (1963), and 't Hart (1969), synthetic speech was offered to subjects who were to give rates on a scale between purely monophthongal and purely diphthongal (allowing for unintelligible stretches), and where for two-componential diphthongs both halves were varied as to their respective F<sub>1</sub>s and F<sub>2</sub>s. Slis and Van Katwijk found that for *ei, ui, ou* there is a high

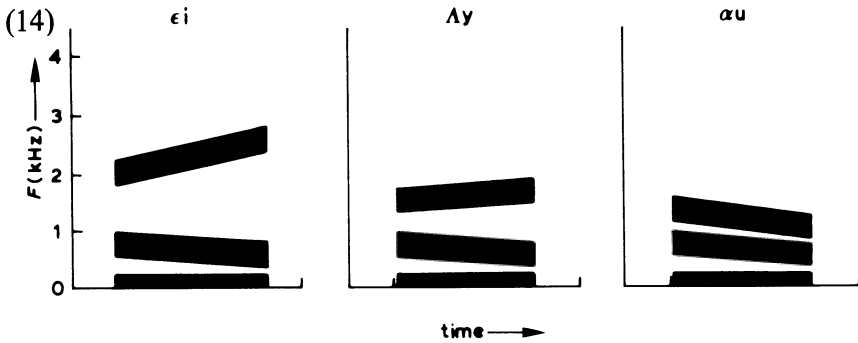
degree of tolerance as regards the starting point of first halves, where the direction towards the second halves is relatively narrowly defined. This can be laid down in the slightly simplified picture in (12) below.



The results of the synthetic speech experiment were checked with a natural speech experiment. It was found with the help of a segmentator that in natural speech the length of the trajectory from starting point to terminus slightly exceeded that of synthetic speech: [ $\varepsilon > I$ ], [ $\Lambda > \phi$ ], and [ $\alpha > \circ$ ]. The results of the experiment are described in 't Hart (1969) as follows:<sup>4</sup>

- (13) . . . the [ $\varepsilon i$ ] is: the Dutch vowel [ $\varepsilon$ ], followed by a *movement in the direction of* [ $i$ ]; the [ $\Lambda y$ ] is the English vowel [ $\Lambda$ ] (of 'cup') - and not Dutch [ $\phi$ ] - followed by a *movement* to [ $y$ ]; [ $\alpha u$ ] is the Dutch vowel [ $\alpha$ ] - and not [ $\circ$ ] - followed by a *movement* to [ $u$ ]. The terminals are reached only in overly correct, isolated speech, in word-final position, and in this case are [ $i$ ], [ $y$ ], and [ $u$ ]. Normally one finds as terminals [ $I$ ], [ $\phi$ ], and [ $o$ ]. (172)

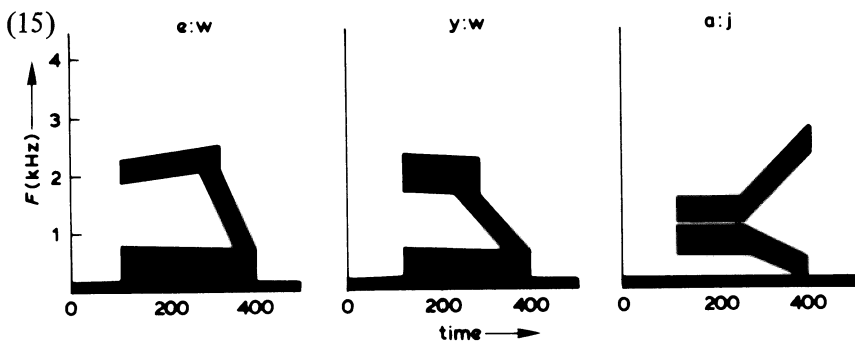
Further illustrations of (12) and (13) are provided by the spectrograms from Nooteboom and Cohen (1977:62) paraphrased here in (14).



Slis and Van Katwijk (1963) note also that their observation on the relative obligatoriness of the direction of the change between the two component parts of the diphthongs *ei*, *ui*, *ou* falsifies Kaiser's claim that only the fall of  $F_1$  is perceptually important, and not so the exact correlates of  $F_1$  and  $F_2$  of the second half.

For the vowels of (11ii) (which, parenthetically, contains (6)), the IPO-investigators found that these are diphthongic as well (i.e., show a change of  $F_1$  in the second half), but they differ from the diphthongs of (11i) in two ways. Firstly, synthetic versions of these vowels did not *require* a second component in order to be still perceivable as the same vowels. Secondly, as opposed to the diphthongs, these vowels require a rather narrowly defined initial range of  $F_1$ - $F_2$  correlates, with a subsequent high amount of tolerance for the direction of the  $F_1$  fall. It was also found that before *r*, where phonetically the diphthongs of (11i) do not occur, the vowels of (11ii) lengthen in a very specific way. Thus, [*a*] goes to *r* via [ $\epsilon$ ], while the other vowels go via [ $\partial$ ].

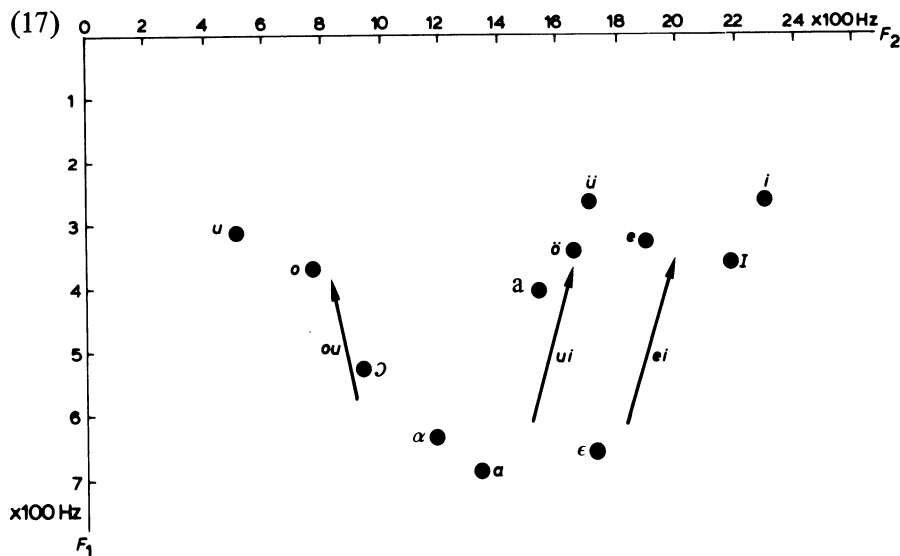
Finally, for the diphthongs of (11iii) it was found that these also were characterized by a change, from an independent vowel contained in (6) towards *i/j*, or *u/w*, although through technical limitations the exact coordinates of the traject towards the latter could not be ascertained accurately. However, some further idea as to the properties of these diphthongs may be gained from the spectrograms provided in Nooteboom and Cohen (1977:62), paraphrased here in (15).



The results of the IPO-group summarized above tally to a considerable degree with those reported on in Mol (1969). He describes an experiment in which a 0.3 second *ei* diphthong was cut into three equal parts. The result was the perception of 'ε - εi - e'. Furthermore, Mol describes the articulatory aspects of the diphthongs as follows:<sup>5</sup>

- (16) When the pronunciation of the diphthong starts, the speech tube may be represented by two tubes, one wide in the oral cavity, and the other narrow in the pharynx. This is the so-called GEMINI-model. During the pronunciation of the diphthong, the *oral tube* is constricted in the middle in the form of a diabolo. A hardware model of this mechanism, driven by an artificial larynx, produces a clearly recognizable diphthong. Which of the three diphthongs is created depends on the length of the oral tube, which is different for each of the diphthongs. (163)

In terms of  $F_1$  and  $F_2$ , Mol's description implies that  $F_2$  characterizes the nature of the diphthong, while  $F_1$  decreases 'tumultuously' during the articulation of the diphthong. Plotted in a vowel diagram, Mol's results may be represented as in (17), which may be compared with (12) above (Mol, 1969: 166).



Notice that (17) confirms rather accurately the figures given for the fall of  $F_1$  by Kaiser (1943).

Within the framework of Dutch structural phonology, as it was established under the impetus of the Prague linguistic school in which some Dutch scholars played a major role, the single most-discussed topic is no doubt that of the proper representation of the Dutch diphthongs *ei*, *ui*, and *ou*. In fact, the participants in the discussion were concerned with two issues. Firstly, there were different views on the mono- vs. biphonemetic status of these diphthongs, and secondly, among those who favored the monophonemetic interpretation, there was some argument as to whether these diphthongs should be included among the 'long' vowels, or should be considered a separate class of phonemes on their own. The most important literature may be summarized as follows.

(18)

(a)	(b)
<i>baat</i>	<i>pad pet</i>
<i>boot leut beet</i>	<i>put</i>
<i>boet bruut biet</i>	<i>pot pit</i>

(19)

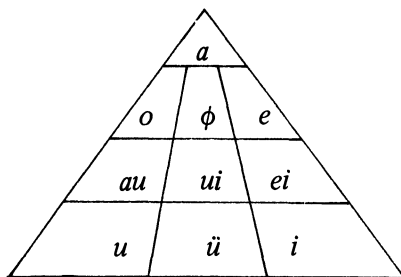
*kou*      *lui*      *lei*

The diphthongs of (19) are phonemically units. The fact that the first

half of *ui* [œy] does not occur independently in the language argues for De Groot that *ui* is a phonological unit, while the fact that *ei* and *ou* have precisely the same internal structure as *ui* argues that these too should be looked upon as single phonemes. Among the 'dull' vowels De Groot posits a separate class of 'long dull' vowels, occurring only in loanwords such as *rose* 'pink' [rɔ:zə], *freule* 'lady' [frœ:lə], and *serre* 'sun-lounge' [sɛ:rə]. Finally, De Groot considers (without further elaboration) the phonetic diphthongs of (11iii) as phonologically two phonemes each, where the components are found among the 'clear' vowels.

Up to a considerable degree, Van Ginneken (1931, 1934) agrees with the 1931-2 analysis by De Groot. Firstly, since the separate parts of the (11iii) diphthongs can all occur independently, these diphthongs are phonologically biphonemetic. Secondly, he agrees with De Groot's division of the monophthongic vowel system into two subsystems as in (18), although he replaces De Groot's 'clear' vs. 'dull' by 'unchecked' vs. 'checked' which, according to a footnote (354), equal Sievers' 'schwachgeschnitten' vs. 'scharfgeschnitten'. Thirdly, he agrees that *ei*, *ui*, *ou* are monophonemetic diphthongs, since their component parts do not occur independently. However, as opposed to De Groot, Van Ginneken does not include these diphthongs in a separate triangle, but places them among the 'unchecked' vowels, where *i* : *ü* : *u* and *e* : *ö* : *o* show the same correlation of front-nonround : front-round : back as among the diphthongs *ei* : *ui* : *ou*. Thus, Van Ginneken assumes the triangle of (20) by the side of (18b).

(20)



In his 1939 monograph *Phonologie, een hoofdstuk uit de structurele taalwetenschap*, Van Wijk, the third great Dutch pre-war structuralist phonologist, agrees completely with Van Ginneken, although his arguments are more clearly articulated. Firstly, he argues that the (11iii) diphthongs are biphonemetic because, if a vowel follows as in (21) the second halves of the diphthongs become parts of the second syllable, which shows that these diphthongs consist of two parts:

(21)	<i>nieuw</i>	'new'	<i>nieuw-e</i> (attr.)	<i>ni-wə</i>
	<i>leeuw</i>	'lion'	<i>leeuw-en</i> (pl.)	<i>le-wə</i>
	<i>groeï</i>	'grow'	<i>groeï-en</i> (infin.)	<i>ɣru-jə</i>
	<i>gooi</i>	'throw'	<i>gooi-en</i> (infin.)	<i>ɣo-jə</i>
	<i>fraai</i>	'beautiful'	<i>fraai-e</i> (attr.)	<i>fra-jə</i>

Moreover, the initial elements of the second syllables are consonantal, which argues that the final halves of the diphthongs when word-final, although phonetically vowel-like, are combinatory variants of the consonantal phonemes which occur initially in *ja* 'yes', *jaar* 'year', *wie* 'who' *wat* 'what', and so on. Secondly, the diphthongs *ei*, *ui*, *ou* are phonologically monophonematic, not because their parts do not occur independently (since in this case they could be combinatory variants of phonemes occurring elsewhere), but rather because they are 'unzerlegbar', i.e. they characteristically show a gradual change from one vowel into another. This gradual connection is not interrupted when a vowel follows, as in *kei-en* 'boulders', and *bouw-en* 'to build', where the syllable division equals the morphological division. Furthermore, these diphthongs belong in one system with the vowels of (18a) since they share the property of being 'schwach-geschnitten': they are allowed to reach their sonority-peak freely. As one of the results of this property, both kinds of vowels are allowed to stand in a final open syllable, as opposed to those which are 'scharf-geschnitten', which characteristically occur in closed syllables, as in (18b).

As opposed to the above analysis, Van Wijk in his 1939 article in *De Nieuwe Taalgids* retreats slightly on his own steps in admitting that upon reconsideration he hesitates between De Groot's system where diphthongs form a separate class (also accepted by Trubetzkoy, 1939: 177-8), and his own, where the diphthongs are included among the 'schwach-geschnitten' vowels. According to Van Wijk, the fact that the diphthongs pattern with the 'schwachgeschnitten' vowels argues that they form one class. On the other hand, phonetically the two are completely different. Thus, he is not able to find a compelling argument for either (18)-(19) or (18b)-(20), although for the latter he would now actually prefer (22).

(22)	<i>aa</i>		
	<i>ou</i>	<i>ui</i>	<i>ei</i>
	<i>oo</i>	<i>eu</i>	<i>ee</i>
	<i>oe</i>	<i>uu</i>	<i>ie</i>

With reference to Van Wijk (1939), an argument in favour of (22) plus

(18b) rather than De Groot's system is put forward by Paardekooper (1948). He observes that in a lot of cases the diphthongs *ei*, *ui*, *ou* alternate with 'long' vowels, which would indicate that they belong the same system. Examples he gives are:

(23)	<i>slijten</i>	'to wear'	- <i>sleten</i>	(past pl.)
	<i>bijten</i>	'to bite'	- <i>een beet</i>	'a bite'
	<i>sluiten</i>	'to close'	- <i>sloten</i>	(past pl.)
	<i>buigen</i>	'to bow'	- <i>een boog</i>	'a bow'
			<i>beugel</i>	'brace'
	<i>houwen</i>	'to hew'	- <i>hieuwen</i>	(past pl.)

The two post-war handbooks on the phonetics and structural phonology of Dutch mentioned above, Van den Berg (1959) and Cohen et al. (1959), differ as to their interpretations of the diphthongs *ei*, *ui*, *ou*. Cohen et al. observe that these diphthongs could be described either as monophonematic, or as biphonematic  $/\epsilon i/$ ,  $/\Lambda \ddot{u}/$ , and  $/\upsilon u/$ , where all components occur independently in, for instance,  $/b\epsilon l/$  *bel* 'bell',  $/b\Lambda l/$  *bul* 'diploma',  $/b\upsilon l/$  *bol* 'ball',  $/t\epsilon n/$  *tien* 'ten',  $/f\ddot{u} t/$  *fuut* 'grebe', and  $/m\upsilon s/$  *moes* 'mash'. The authors argue that in such apparently balanced cases one chooses the phonologically simpler solution over the more complex one, which criterion here selects the latter option: the monophonematic interpretation requires one additional phonological opposition of monophthong vs. diphthong, and has to allow three more phonemes. This argument is slightly modified in the 1961 edition of the *Fonologie*, where it is pointed out that the phonetic realizations of the biphonematic diphthongs contain in their first halves combinatory variants  $[\ddot{a}, \epsilon, \ddot{a}]$  of the vowels of *pet*, *put*, *pot* which are  $[\epsilon, \Lambda, \upsilon]$ . Furthermore, they drop the simplicity argument in favour of the biphonematic interpretation, replacing it by three new observations. Firstly, they argue that if a sound has phonetically two clearly distinguishable parts, then *ceteris paribus* one chooses a biphonematic interpretation for that sound. Secondly, they claim that a monophonematic interpretation would imply that  $/\epsilon i/$  etc. are non-existent in Dutch, 'which blatantly contradicts the facts because every Dutchman hears *pij* when  $\epsilon i$  is uttered after  $p$ '<sup>6</sup> (28). Finally, although they are not overly convinced by this argument, the authors claim that the separate parts of the diphthongs may be interchanged with independent phonemes, as in  $/k\epsilon i k/$  *kijk* 'look' vs.  $/k\Lambda i k/$  *klied* 'clique' vs.  $/k\epsilon \Lambda k/$  *kelk* 'calice', which would again argue for the biphonematic interpretation.

In his 1962 *Inleiding tot de Algemene Taalwetenschap* (p. 164), De Groot accepts the arguments of the *Fonologie* towards a biphonematic



interpretation of the Dutch diphthongs, although he does not consider the case 'proven'. In the first 1959 edition of the *Foniek* Van den Berg conforms completely to the pre-war monophthongic interpretation of *ei*, *ui*, *ou*, while in later editions, especially when the author attempts to apply the principles of generative phonology to Dutch, the phonological interpretation of diphthongs has disappeared completely (cf. edition 6, 1972: 50).

After 1960 the question of the number of phonemes contained in the Dutch diphthongs is dealt with in Morciniec (1968), and Cohen (1971). Furthermore, the question of the place of the diphthongs within the entire vocalic system is taken up in Moulton (1962), and Damsteegt (1968). In the final part of this section we will deal with these papers in their chronological order.

Moulton (1962) presents an intriguing analysis of the vocalic system of Dutch from the point of view of structural phonology. He firstly does not accept any of the earlier divisions between the sets of vowels in (18a) vs. (18b). Thus, De Groot's proposal that the distinction is one between the 'acoustic' notions 'clear' vs. 'dull' 'merely tells us that the two classes exist (a fact which we all intuitively accept), and then it attaches labels to them' (299). On Van Wijk's proposal that the distinction is one between 'schwachgeschnitten' vs. 'scharfgeschnitten', Moulton accepts Van Haeringen's (1958) argument that 'there is no way of determining that the syllable boundary which follows the [schwachgeschnitten] vowels . . . is in any way different from that which follows the [scharfgeschnitten] vowels . . .' (300). Finally, Cohen et al.'s distinction between 'tense' vs. 'lax' resembles De Groot's in that 'it is acceptable only after we have already separated these vowels into two different classes. That is to say, it does not tell us why we intuitively set up these two classes in the first place' (300-1). Concluding that the attempts at making phonetic distinctions between the two sets of vowels have failed, Moulton goes on to present five *structural* arguments. They run as follows:

- (i) (18a) occur in final position, not so (18b) (except for some interjections):

<i>zie</i>	'see'	<i>moe</i>	'tired'
<i>zee</i>	'sea'	<i>zo</i>	'such'
<i>nu</i>	'now'	<i>la</i>	'drawer'
<i>reu</i>	'male dog'		

- (ii) (18a) occur before /j/ and /w/, not so (18b), cf. (2);

- (iii) (18a) do not occur before (most) final consonant clusters, as opposed to (18b):

<i>nimf</i>	'nymph'	<i>korf</i>	'basket'
<i>terp</i>	'terp'	<i>hals</i>	'neck'

(iv) as in (iii), for medial clusters, cf.

<i>nimfen</i>	<i>korven</i>
<i>terpen</i>	<i>halzen</i>

(plurals of the forms in (iii));

(v) (18a) followed by a sonorant take the diminutive suffix *-je*, preceded by a voiceless plosive homorganic to the final sonorant:

<i>kiel</i>	'keel'	<i>kieltje</i>
<i>zeem</i>	'chamois'	<i>zeempje</i>
<i>baan</i>	'job'	<i>baantje</i>

(18b) followed by a sonorant take *-etje*:

<i>zin</i>	'sentence'	<i>zinnetje</i>
<i>kar</i>	'cart'	<i>karretje</i>
<i>bal</i>	'ball'	<i>balletje</i>

Moulton goes on to observe that in all five cases the diphthongs *ei*, *ui*, *ou* pattern with the (18a) vowels, cf.:

(i) cf. (2);

(ii) forms in (i) followed by *-ə*, such as plural *keien* [*kɛijə*], and so on;

(iii) no diphthongs before final clusters;

(iv) no diphthongs before medial clusters;

(v) diminutives such as:

<i>Paul</i>	'Paul'	<i>Paultje</i>
<i>rijm</i>	'jingle'	<i>rijmpje</i>
<i>tuin</i>	'garden'	<i>tuintje</i>

The structural difference between diphthongs and (18a) vowels lies in the fact that the latter may occur before *r*, but not so the former, cf.:

<i>bier</i>	'beer'	<i>boer</i>	'farmer'
<i>beer</i>	'bear'	<i>boor</i>	'drill'
<i>buur</i>	'neighbor'	<i>daar</i>	'there'
<i>deur</i>	'door'		

However, there are also some phenomena to show that *ie*, *uu*, *oe* out of (18a) do not consistently pattern as (18a) vowels. Thus, (iii) and (iv) are violated by some past tense forms such as:<sup>7</sup>

<i>wierp-wierpen</i>	of	<i>werpen</i>	'to throw'
<i>wierf-wierven</i>		<i>werven</i>	'to recruit'
<i>stierf-stierven</i>		<i>sterven</i>	'to die'
<i>zwierf-zwierven</i>		<i>zwerven</i>	'to wander'
<i>bedierf-bedierven</i>		<i>bederven</i>	'to spoil'
<i>hielp-hielpen</i>		<i>helpen</i>	'to help'

Furthermore, (v) is violated by diminutives such as *bloemetje* 'little flower', and *wieletje* 'little wheel'. These facts taken together lead Moulton to assume that *ie*, *uu*, and *oe* in some sense belong to both systems at the same time, and in order to express this he constructs the system in (24), capturing all vowels in one sweep.

(24)

	Front spread	Front rounded	Back rounded	
High	$\overset{\vee}{i}$	$\overset{\vee}{y}$	$\overset{\vee}{u}$	short~long~diphthongal
Higher-mid	$\overset{\vee}{e}, \bar{e}$	$\overset{\vee}{\phi}, \bar{\phi}$	$\overset{\vee}{o}, \bar{o}$	short≠long~diphthongal
Lower-mid	$\overset{\vee}{\epsilon}, \bar{\epsilon}, \epsilon i$	$-, \bar{\alpha\epsilon}, \alpha\epsilon y$	$\overset{\vee}{\omega}, \bar{\omega}, \omega u$	short≠long≠diphthongal
Low		$\overset{\vee}{a}, \bar{a}$		short≠long

(Moulton, 1962: 310). Moulton comments that this 'arrangement indicates the fact that *ie*, *uu*, *oe* show short, long, and diphthongal allophones, in non-contrastive distribution; and that *ee*, *eu*, *oo* show monophthongal and diphthongal allophones, also in non-contrastive distribution'. Notice that  $\bar{\epsilon}$ ,  $\bar{\alpha\epsilon}$ , and  $\bar{\omega}$  occur only in French loanwords.

Damsteegt (1968) discusses two arguments for putting diphthongs and (18a) vowels together in the same structural class, both advanced in the third edition of Van den Berg's *Foniek*. In the first argument it is claimed that both belong together because both are diphthongic. Apparent ignorance of the IPO and Amsterdam investigations leads Damsteegt to conclude that insufficient clarity of the phonetic facts hamper a proper evaluation of this argument. Secondly, it is claimed that both belong together because neither occurs before *r*. However, as Damsteegt points out, this argument hinges on the premise that the vowels of *eer* 'honour', *deur* 'door', *oor* 'ear', and so on, cannot be equated with those of *leed* 'grief', *leut* 'fun', and *koot* 'knuckle-bone'. While this may be true phonetically, according to

Damsteegt Van den Berg overlooks the fact that this is not necessarily so phonologically, since the vowels before *r* may well be allophonic variants of vowels in other positions. Although he does not mention Moulton's study, Damsteegt thus concludes in the same vein that there is at least one structural difference between diphthongs and (18a) vowels: they pattern differently before *r*.

Morciniec (1968), in a discussion of the arguments advanced for the biphonematic interpretation of Dutch diphthongs in Cohen et al.'s *Fonologie*, attaches little importance to the simplicity argument of the first edition, but puts forward as the first and foremost argument the replacibility of the respective components of the diphthongs. Thus, the second half of *bijt* 'bite' [beɪt] and *buik* 'belly' [bœyk] are replacible by the phoneme *l* in *belt* 'tolls' [bɛlt] and *bulk* 'bellow' [bælk], while the second halves of *hout* 'wood' [hɔut] is replaced by *n* in *hond* 'dog' [hɔnt]. Consequently, diphthongs should be treated as biphonematic phonologically. While this supports the analysis of the *Fonologie*, Cohen (1971) in fact withdraws the analysis of the latter. Thus, he admits that

- (25) The fact that [the diphthongs] could be characterized by setting up two steady state vocoid segments was at one time regarded, as I now believe erroneously, as a fair indication of a biphonematic interpretation (Cohen et al. 1961). (282-3)

Cohen then goes on to reject both the biphonematic and the monophonematic interpretations, arguing that the latter unjustifiably puts out the diphthongs together with the 'long' vowels, while the former is

- (26) equally unsatisfactory since:

- (a) it does not seem 'natural' to naive native speakers,
  - (b) it introduces a class feature distinction [vocalic vs. non-vocalic] which cannot be supported by phonetic evidence,
  - (c) It does not explain why e.g. in errors of speech two segments together are always involved, whereas in the case of other closeknit units, such as consonant clusters, individual members of these groups are found to play a part.
- (288).

Cohen then goes on to suggest that the 'way out seems to be to suggest to account by way of a special feature for the idiosyncratic phenomenon of diphthongs of the type described' (288). It may be worth observing that this proposal has a lot in common with Moulton's analysis. We will have occasion to return to it below.

#### 4. Generative phonology

As pointed out in the introduction to this paper, the phonological component of a generative grammar must be viewed as a set of (partially) ordered phonological rules, connecting the underlying representations to the surface phonetic representations. Given the fact that the depth of this component is constrained by Postal's Naturalness Condition, one could claim in general terms on the subject of the Dutch diphthongs that they will be diphthongs, unless there is some reason to deviate from their phonetic characteristics, a reason expressible in terms of a generalization about the phonology of Dutch. Put slightly differently, the generative framework allows one to regard the phonetic diphthongs (and in fact any phonetic entity) as something, say *Q*, which deviates from the phonetic representation, as long as the phonology contains a schematic rule or rules of the form

(27)      *Q*    →    phonetic diphthong

where 'phonetic diphthong' is the phonetic representation of the Dutch diphthongs as described in section 2, and where *Q* is something different (present either at the underlying level, or derived as output of one or more previous rules), and motivated by generalizations about the phonology of Dutch. Below, we will first provide a brief survey of previous proposals on the Dutch diphthongs within the framework of generative phonology. In particular we will survey the various interpretations of '*Q*' in these works. Secondly, we will provide an interpretation of our own, based primarily on the so-called 'intervocalic *d*' phenomena of Modern Western Dutch. Finally, we will point out some consequences of our approach for other areas of Dutch phonology.

Several attempts have been made in the recent past to represent the diphthongs of Dutch within a generative phonological framework at a more abstract level as something other than diphthongs, the argument in the earlier works being that this leads to a more acceptable inventory of underlying segments. The earliest generative description of the vocalic system of Dutch, De Rijk (1967), is characterized by an attempt to reduce all diphthongs to monophthongs at the underlying level. Making use of Cohen's feature [tense] for the distinction between (18a) and (18b) De Rijk claims that the diphthongs of the *ieuw*-class, which with a handful of exceptions<sup>8</sup> always occur in morpheme-final position, lack their second halves at the underlying level, which makes them morpheme-final tense vowels. The second halves are then provided by a phonological rule which

adds a [-voc, -cons] segment disharmonic to these vowels in morpheme-final position. In their turn, Cohen's surface morpheme-final 'tense' vowels (*zie*, *zee*, etc. above) escape the rule by being underlyingly 'lax' (i.e. [-tense]). They undergo a morpheme-final tensing rule, ordered after the 'glide' insertion rule. Here the procedure stops since there are no surface morpheme-final 'lax' vowels to be exempted from the tensing rule.<sup>9</sup>

Secondly, De Rijk attempts to characterize diphthongs of the *ei*-class as underlyingly 'high tense' vowels in all positions. Their phonetic manifestations are then derived by two rules: (i) a rule adding a [-voc, -cons] 'glide' segment; and (ii) a rule lowering the first halves of the resulting combinations. However, this time De Rijk is not able to find a suitable underlying representation for the surface 'high tense' vowels, and eventually he concludes that the *ei*-diphthongs had better be characterized as combinations of vowel plus glide at the underlying level: *ey*, *üμ*, and *ow*.

Apparently agreeing with De Rijk's first analysis of the *ei*-diphthongs, Van Bakel (1976) finds an alternative representation for the surface 'high tense' vowels in making them 'high lax' vowels underlyingly: they will be tensed by a later rule. In his system (which allows four vowel heights motivated, according to Van Bakel, by analyses of Dutch dialects) the 'high lax' vowels of (18b) are 'high mid lax' vowels.

Brink (1970) represents the diphthongs *ei* and *ui* as underlying tense vowels of indifferent height, and in order to differentiate them from the surface tense vowels he introduces upon the former the feature [+diphthongal]. According to Brink the 'advantage in historical studies of having such a feature available is obvious' (10). Furthermore, in order to explain some distributional gaps, the diphthong *ou* is proposed to have three different underlying sources: *ol*, *al*, and *öow*. Phonological rules will turn the latter into *ou*. Brink represents the *ieuw*-diphthongs as combinations of 'tense' vowels followed by disharmonic [-syll, -cons] 'glides' at the underlying level. De Rijk's rules of 'glide' insertion and 'final vowel tensing' are replaced with 'morpheme structure conditions' with essentially the same contents.

These three analyses, as briefly reviewed above, clearly employ *ad hoc* mechanisms of various types. Firstly, they all employ the feature [tense], the doubtful nature of which for Dutch was already underscored by Moulton (1962). Furthermore, all assume that the second halves of the Dutch diphthongs are [-voc, -cons] or [-syll, -cons], i.e. neither vowels nor consonants, which, in view of the phonetic descriptions of section 2, is an abstract representation that should be accompanied by at least some amount of motivation. But this motivation is lacking in all works. Finally,

Brink's claim that the new feature [diphthongal] is obviously useful in historical studies goes unsupported in his book, and the same holds for Van Bakel's preference for a four height vowel system over a simpler three height system.

Another attempt at a characterization of the Dutch vocalic system is made in Smith (1973). He discusses the so-called 'intervocalic *d*' phenomena of Modern Western Dutch, some occurrences of which are displayed in (28).

(28) /reed-en/	'drove'	>	[re:jə]
goed-e	'good, attr.'	>	[ɣujə]
rood-e	'red, attr.'	>	[ro:jə]
kwaad-e	'angry, attr.'	>	[kwa:jə]
glijd-en	'to slide'	>	[ɣleijə]
kruid-en	'herbs'	>	[krʌɣjə]
oud-e	'old, attr.'	>	[ɑuwə]
snijd-en	'to cut'	>	[snɛijə]

Since *d* never reduces after (18b) vowels (*radde* 'fast, attr.' > \**rajə*; *redde* 'to save' > \**rejə*; *padden* 'toads' > \**pajə*), it is clear that the rule(s) required in a description of these phenomena should make a generalization over (18a) ('tense', 'long') vowels and diphthongs. Smith's first proposal is to use the representations of De Rijk (1967) (with 'syllabic' replacing 'vocalic') resulting in:

$$(29) \quad \left[ \begin{array}{c} +\text{syll} \\ <-\text{tense}> \end{array} \right] \left\langle \left[ \begin{array}{c} -\text{cons} \\ -\text{syll} \end{array} \right] \right\rangle$$

Given the appropriate abbreviatory conventions, (29) collapses (30i) and (30ii), in that order.

$$(30) \quad (i) \quad \left[ \begin{array}{c} +\text{syll} \\ -\text{tense} \end{array} \right] \quad \left[ \begin{array}{c} -\text{cons} \\ -\text{syll} \end{array} \right] \quad (ii) \quad \left[ \begin{array}{c} +\text{syll} \\ +\text{tense} \end{array} \right]$$

Smith, however, does not find this a completely satisfactory solution, and he goes on to make a second, tentative, proposal to the effect that 'tense' vowels may be represented as sequences of two 'lax' ones, at least for the purpose of the intervocalic *d* phenomena. This 'bimoric' representation is not at all unnatural, and has been proposed in the past for many languages with oppositions between vowels such as those in (18a) and (18b), both within structural and generative analyses. The resulting generalization over 'tense' vowels and diphthongs is that of (31).

## (31) [-cons] [-cons]

In Zonneveld (1978) the initial aspects of Smith's hypothesis are accepted, but it is developed differently. Firstly, it is argued that at the underlying level Dutch does not have segments which are [-syll, -cons] 'glides', but rather that Dutch underlying segments are either consonants or vowels, [+cons] or [-cons]. Thus, the final halves of the *ieuw*-diphthongs are consonantal underlyingly, which they remain when followed by a vowel, while they are turned into the sounds described in section 2 in final position. The absence of underlying glides also obviates the need for the feature 'syllabic' at this level. Since segments will be either consonantal or non-consonantal, this single binary feature will suffice for the classification of underlying Dutch segments. This is not to say, of course, that the feature 'syllabic' will not play a role at further phonological levels of Dutch phonology, but rather that its values will be predictable from the values of other features, either by language specific rules, or by universal conventions.

Secondly, a set of rules is proposed in Zonneveld (1978) for the intervocalic *d* phenomena in Dutch which differ rather drastically from those in Smith (1973). In two of these rules the generalization constituted by [-cons] [-cons] figures as follows:<sup>10</sup>

## (32) D WEAKENING

$$d \rightarrow <j> \quad / \quad [-cons]_i \left[ \begin{array}{c} -cons \\ < +back > \end{array} \right] <i> -\# \varnothing$$

## HOMORGANIC GLIDE INSERTION

$$\varnothing \rightarrow \left[ \begin{array}{c} +son \\ +high \\ \alpha back \end{array} \right] \quad / \quad [-cons] \left[ \begin{array}{c} -cons \\ -low \\ \alpha back \end{array} \right] \text{---} (\#) [+syll]$$

Notice that the rule of D WEAKENING abbreviates two subrules, the first of which turns *d* into *j* after (18a) *back* vowels, and the second of which deletes *d* after the remaining (18a) vowels, and after diphthongs. In effect, the longer rule with angled brackets stands in a 'special case' relation to the shorter, 'elsewhere' deletion rule. The reason for this is outlined in Zonneveld (1978). Secondly, the rule of HOMORGANIC GLIDE INSERTION provides the appropriate 'high sonorant' segment (further details will be presently irrelevant) in those cases where *j* is not provided by the rule of D WEAKENING. Notice that HGI requires 'full' (syllabic)



vowels as its righthand environment. The usefulness of this feature in this case will be pointed out below. Some sample derivations employing the rules of (32) will run as in (33):

(33)	<i>reed-en</i>	<i>goed-e</i>	<i>oud-e</i>
D WEAK	$\emptyset$	<i>j</i>	$\emptyset$
HGI	<i>j</i>	—	<i>w</i>

It is worth observing that the analysis of intervocalic *d* phenomena proposed here, in spite of the importance of an adequate representation of the Dutch vocalic system to them, does not require the objectionable feature [tense], the unmotivated feature [diphthong], abstract 'glides', or an unmotivated system of four vowel heights, like previous analyses of Dutch vowels. Rather, Dutch vowels are claimed to be [-cons], may be single or double, and the double ones may be identical or not.

It may be useful to pursue this analysis somewhat further, and see how it will account for the distributional facts surfaced in the structural analyses discussed in section 3. Firstly, the fact that only bisegmental vowels (including diphthongs) may occur in final position may be accounted for by a morpheme structure condition of the general type (34):

$$(34) \quad \sim \times [+cons] [-cons] +$$

which denies the existence of monosegmental morpheme-final vowels. Similarly, constraints on the occurrence of vowels before clusters may be expressed in conditions of the general type (35):

$$(35) \quad \sim \times [-cons] [-cons] C C Y$$

and so on.

The fact that monosegmental vowels do not occur before *j* or *w* is expressed in our framework in two different ways. When the combination is anorganic, it will be described by a morpheme structure condition à la Brink (with the proviso that for us *j* and *w* are consonantal, and 'tense' vowels are bisegmental). When the combination is homorganic, it will result from the application of the rule of HOMORGANIC GLIDE INSERTION in (32).

Furthermore, the phenomenon of the diminutive suffix depending on the phonological make-up of the preceding stem will be taken care of by a phonological rule of schwa-insertion of type (36):

$$(36) \quad \emptyset \rightarrow \text{ə} / [+cons] [-cons] \left[ \begin{array}{c} +cons \\ +son \end{array} \right] \text{——} \# [+DIM]$$

In Zonneveld (1978) it is proposed that irregular forms such as *wiel+etje* may result from an irregular application of (36) to a schwa-less underlying form *wiel+tje*. In order to capture this, *wiel* will be lexically marked [+D], and (36) will be reformulated slightly into (37):

$$(37) \quad \emptyset \rightarrow \text{ə} \quad / \quad \left\{ \begin{array}{c} [+cons] \\ [+D] \end{array} \right\} [-cons] \left[ \begin{array}{c} +cons \\ +son \end{array} \right] \text{ ——— } \# [+DIM]$$

The alternations between ‘bisegmental’ vowels and diphthongs described by Paardekooper (cf. (23)) may be captured by rules of the general type (38):

$$(38) \quad [-cons]_i [-cons]_j \quad \sim \quad [-cons]_i [-cons]_j$$

where  $\sim$  indicates a lexical relation between different tenses of irregular verbs, and between verb and derived noun.

Finally, potentially most interesting is the difference in distribution between ‘bisegmental’ vowels and diphthongs before *r*, as discussed in section 3. As observed there, the former occur immediately before *r* (as do monosegmental vowels) while the latter do not. However, this observation appears to follow from the spelling system of Dutch rather than from phonetics since, as pointed out in section 2, in actual fact ‘bisegmental’ vowels are separated from *r* by a *ə*-like sound (or an *ɛ*-like sound for *a*). It may be worth pointing out that if this transitional sound is provided by a ‘late’, phonetic rule of Dutch, then there seems little reason not to seize the opportunity to capture with the same rule those cases where diphthongs are separated from *r* by a *ə*-sound (represented by *e* in writing) as in (39):

(39)	<i>Beier-en</i>	‘Bavaria’	<i>luier</i>	‘napkin’
	<i>meier</i>	‘bailiff’	<i>schuier</i>	‘brush’
	<i>meier</i>	‘100 guilders’	<i>shuier</i>	‘veil’
	<i>lauwer</i>	‘laurel’	<i>uier</i>	‘udder’

This generalization of the rule is in fact supported by the alternation of *lauwer* with *laurier* ‘(something made of) laurel’, which shows that schwa is inserted post-tonically before final *r*. That schwa is not deleted pretonically is shown by the form *verbouweréerd* ‘flabbergasted’, which retains pretonic schwa. Furthermore, that schwa is inserted before only *final r* is shown by the existence of forms such as *wierp* and *zwierf* mentioned earlier, which go without schwa, and by schwa-less pretonic diphthongs, such as in the words of (40):

- (40) *auróra* 'id.' [aur-] *heuristisch* 'heuristic' [hɛɪr-]  
*aureóol* 'halo' [aur-] *Európa* 'Europe' [ɛɪr-]  
*Peyrác* 'id.' [pɛɪr-]

Thus, a framework seems feasible where underlyingly *r* is preceded by all types of vowels, while ə is inserted after 'bisegmental' vowels and diphthongs by a rule such as (41):

- (41)  $\emptyset \rightarrow \text{ə} \quad / \quad [-\text{cons}] \quad [-\text{cons}] \text{ — } r \quad \#$

Similarly, it may also be feasible to avoid specifying past tenses such as *wierp* and *zwierf* as exceptions to the constraint against (18a) vowels before clusters at the underlying level. Specifically, it appears to be the case that the vowel [ɪ] does not occur at all before a liquid followed by a labial obstruent (except in the onomatopoeic word *tsjilpen* 'to chirp'). Thus, the past tense of verbs such as *werpen* and *zwerpen* may differ from the present tense in height, and may be doubled by a phonological rule such as (42):

- (42) 
$$\begin{array}{c} \left[ \begin{array}{l} -\text{cons} \\ -\text{back} \\ -\text{round} \\ +\text{high} \end{array} \right] \quad \left[ \begin{array}{l} +\text{son} \\ -\text{nas} \end{array} \right] \quad \left[ \begin{array}{l} +\text{cons} \\ +\text{ant} \\ -\text{cor} \end{array} \right] \\ 1 \quad \quad \quad 2 \quad \quad \quad 3 \quad \quad \rightarrow \quad 1 \ 1 \ 2 \ 3 \end{array}$$

Finally, rule (41) will have to be adjusted slightly for two reasons. Firstly, as pointed out earlier, it will have to insert *ɛ* rather than *ə* for the combination *aar*, but we will not go into that specific phenomenon here. Secondly, however, (41) should account for the fact that its schwa is a syllabic nucleus after diphthongs, but not so after 'bisegmental' vowels. Thus, words such as those in (39) contain a homorganic glide in between diphthong and schwa ([mɛɪjər], and so on), while *bier* and so on are monosyllabic, without a homorganic glide. This is effectuated by a slight reformulation of (41) into (43):

- (43)  $\emptyset \rightarrow \left[ \begin{array}{c} \text{ə} \\ -\text{cons} \\ -\text{syll} > \end{array} \right] / \quad [-\text{cons}]_i \quad [-\text{cons}]_{<i>} \text{ — } r \quad \#$

Thus, via (43) the fact is captured that the transitional sound will be non-syllabic after bisegmental vowels. After diphthongs, schwa will be non-consonantal, where the feature [+syll] will be supplied either by another language-specific rule, or by a universal convention, [+syll] being the natural state for a non-consonantal segment. Given this procedure, the rule

- <sup>10</sup> For expository purposes these rules are slightly adjusted vis-à-vis those presented in Zonneveld (1978).

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# THE LOOKING GLASS WAR: ON THE ROLE OF HYPERCORRECTION IN PHONOLOGICAL CHANGE

WIM ZONNEVELD

## 1. Introduction\*

This paper deals once more with the assumption of the 'Ausnahmslosigkeit' of sound change, also known as the 'neogrammarian doctrine that sound changes operate without exceptions' (Wang, 1969: 9), or the REGULARITY HYPOTHESIS (Hocket, 1965: 186ff.). More specifically, I will combine in this paper two independent notions of diachronic phonology in an attempt to explain a certain range of hitherto complex and puzzling data, in essence exceptions to the REGULARITY HYPOTHESIS. These notions are Wang's *competing changes*, to be discussed in section 2; and *rule conversion*, and within this cover-notion more properly DeCamp's *rule symmetry* rather than Vennemann's much more well-known *rule inversion*, to be discussed in section 3. In section 4 I intend to show how the proposed combination of these two notions works to explain a certain class of diachronic developments in Dutch phonology, seemingly contrary to the REGULARITY HYPOTHESIS. In the exposition a central role will be reserved for the notion *hypercorrection*. This notion will be treated as coherently and explicitly as (my) current understanding allows, and its apparent range and limitations will be indicated.

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\* This paper is a revised version of chapter 4 of my doctoral thesis, Zonneveld (1978). It was read in a condensed version at the Second Annual Morphology Meeting, 20 April 1977, University of Amsterdam. I am grateful above all to Ans van Kemenade, Daan Wissing, and especially Corriejanne Timmers (cf. her 1977 paper on French *r*) for more than helping to develop the initial ideas, to Henny Corver, Richard Hogg, Frank Jansen, Terry Langendoen, Rob Robinson, Henk Schultink, Johan Taeldeman, Pieter Tiersma, and Mieke Trommelen for comments on earlier versions, and to those attending the Morphology Meeting for their criticism. As usual, all responsibility rests with the author.

## 2. Competing changes

In an impressive series of papers by scholars of the Phonology Laboratory at Berkeley, initiated by Wang's 1969 'Competing Changes as a Cause of Residue', a modification was proposed of the attitude towards, what Wang labels, 'residue' of sound changes in natural languages, which, as is well-known, exists in spite of the REGULARITY HYPOTHESIS, and which has traditionally been subsumed under highly inexplicit labels such as 'borrowing, dialect mixture, analogy, homonym prevention, the effect of tabu and phonetic symbolism, and functional load' (op. cit.: 10). Wang calls these suggestions 'unsatisfyingly ancillary and particularistic. In some cases . . . ad hoc and unconvincing', but contends that 'they remain in the literature for lack of alternative explanations' (id.). His aim in Wang (1969) is to argue for the plausibility of such an alternative explanation, in effect an *explicit* revision of the regularity hypothesis, which makes it read (id., emphasis his):

### (1) MODIFIED REGULARITY HYPOTHESIS

A sound change is regular *if no other changes compete against it*.

In subsequent papers by the PL-group this hypothesis was illustrated and refined, for instance in Wang and Cheng (1970), Hsieh (1971), Chen and Hsieh (1971), Cheng and Wang (1974), Chen (1972, 1974), and Chen and Wang (1975). While the view of sound change that emerges from these works has become widely known as the theory of LEXICAL DIFFUSION, I will discuss these papers here from a slightly different angle, one where lexical diffusion is used as an auxiliary hypothesis to make plausible the notion of COMPETING SOUND CHANGES featuring in the MODIFIED REGULARITY HYPOTHESIS. I will first briefly discuss Wang's paper, and then illustrate his ideas with examples taken from the other works (which overlap to some extent).

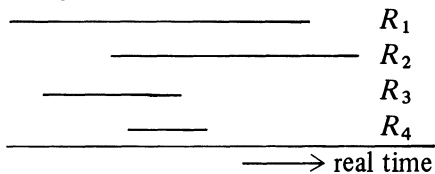
By far the most important feature in Wang (1969) is the distinction made between *gradualness* and *abruptness* as regards sound change. In fact there are several ways in which one can view a sound change as either gradual or abrupt, of which the following three are presently most relevant; (i) *chronological* gradualness (vs. abruptness); (ii) *phonetic* gradualness (vs. abruptness); and (iii) *lexical* gradualness (vs. abruptness).

*A propos* (i), the chronological dimension, Wang holds that sound changes are indeed gradual. They do not implement themselves from one day (second, week) to the next, but rather: 'may take anywhere from



several years to many centuries' (id.) for their operation. This assumption seems utterly reasonable *a priori*, and is easily supported also by factual observation. Given the time-dimension, a pair (group) of sound changes can be of one of two major types: they are either *complementary*, or *intersecting*. The former, successive type has traditionally been considered *the* type of temporal interaction between sound changes, and implies that sound changes simply follow one another in time. The latter implies that sound changes can also be operative during concurrent periods. In this, pairs (groups) can be of three subtypes: *coincident*, *incorporating*, or *overlapping*. This terminology is taken from Bloch (1953: 60),<sup>1</sup> and can be represented schematically as in (2) (cf. Chen, 1974: 69).

(2) Temporally intersecting rules



In (2), each of the pairs  $R_1-R_2$ ,  $R_2-R_3$ , and  $R_3-R_4$  is in an overlapping relation;  $R_3$  is incorporated in  $R_1$ ,  $R_4$  is incorporated in both  $R_1$  and  $R_2$  (this type has been called 'persistent' by Chafe, 1967); the coincident type (historically unlikely, though technically imaginable) would be represented by a  $R_n$  plotted during exactly the same period in real time as one of the changes in (2).

While the assumption of chronological gradualness of sound change has not been subject to very much doubt traditionally, this is not so for Wang's second assumption, that there are at least some (perhaps many) sound changes which operate according to the theory of LEXICAL DIFFUSION. Contrary to traditional assumptions about change, this theory stipulates that within the time dimension at least some (perhaps many) sound changes are lexically gradual in that they pass from one morpheme on to the other, both for the linguistic community as a whole as for individual native speakers. Furthermore, although the theory allows for lexically gradual sound change to be phonetically either abrupt, or gradual as well, it is Wang's contention that 'it remains to be shown that the [phonetically] gradual view is applicable to any sound change at all' (op. cit.: 14). It is common, therefore, to assume under lexical diffusion both lexical gradualness and phonetic abruptness. Schematically again, sound change according to the view of lexical diffusion may be represented as in (3),

(3)

	1	+	+	+	+	+	+	+	+
	2	—	+	+	+	+	+	+	+
	3	—	—	+	+	+	+	+	+
	4	—	—	—	+	+	+	+	+
lexicon	5	—	—	—	—	+	+	+	+
↓	6	—	—	—	—	—	+	+	+
	7	—	—	—	—	—	—	+	+
	8	—	—	—	—	—	—	—	+
		time →							

where + represents the application of a given sound change, and — its (as yet) failure to apply. To give one real-life example of such a change: according to Chen (1972: 470-1) (with data taken from Sommerfelt, 1962: 72-5, who apparently held the view of lexical diffusion in some form) the deletion of the word-initial uvular fricative in some Welsh dialects has proceeded step by step in the manner of (3), cf. (4).

(4)

	$T_1$	$T_2$	$T_3$	$T_4$
to play	<i>xware</i>	<i>ware</i>	<i>ware</i>	<i>ware</i>
flea	<i>xwanen</i>	<i>xwanen</i>	<i>wanen</i>	<i>wanen</i>
sister	<i>xwa:ir</i>	<i>xwa:ir</i>	<i>xwa:ir</i>	<i>wa:ir</i>

In some cases a sound change proceeding via lexical diffusion will leave telltale doublets *en route*, pairs of forms differentiated by the sound change itself and by factors such as tempo and/or style of speech. Doublets can be incorporated into (3) by adding a diagonal of +/— cells on the hypotenuse common to its two complementary right-angled triangles, and by adding to (4) to the right of each  $T_n$  a  $T_n'$  where the topmost occurrence of the uvular fricative is parenthesized.

The assumption of the chronological gradualness of sound change, plus the theory of lexical diffusion together serve to make plausible the notion of intersecting sound changes as set out in (2). In general, and put perhaps somewhat simplistically: the more gradual a sound change, the greater the possibility that it will intersect with another sound change. Of these intersecting sound changes, it is again one subtype in which Wang is primarily interested, so-called *competing sound changes*. In brief, a pair (group) of sound changes is competing when they intersect, and at the same time have a non-trivial ordering relationship. As Wang puts it (op. cit.: 18):

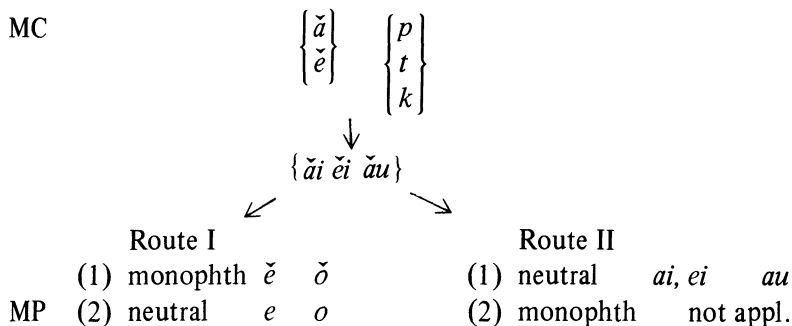
- (5) The competing relation in diachronic rules is approximately the counterpart of the ordering relation in synchronic rules. Two synchronic rules are ordered with respect to each other, if, for an ARBI-

TRARY input set, the output set differs according to the sequence in which the two rules are applied. Diachronically speaking, two rules are in a competing relation if there are morphemes whose phonetic histories would differ according to the sequence in which the two rules are applied.

It is the possibility for sound changes to compete which Wang offers as an explanation for why some changes leave residue: the residue is precisely that part of its input captured by the competing change. As pointed out earlier, it is Wang's primary aim to argue not only for the plausibility of the 'auxiliary assumptions' of chronological gradualness and lexical diffusion, but also for the initial plausibility of the MODIFIED REGULARITY HYPOTHESIS (1): he does not provide examples of competing sound changes other than hypothetical ones. However, further investigation by Wang, and also Chen, Cheng, and Hsieh soon revealed the required examples. By way of illustration, I will discuss here two of them.

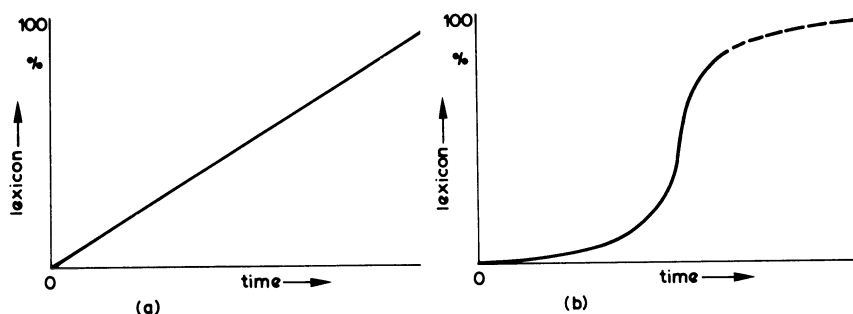
Chen (1972: 481ff.) discusses a case of two overlapping sound changes in Peking dialect, which are moreover in a competing relationship. The two stages to be accounted for are the Middle Chinese stage where so-called 'entering tone' (tone IV) words ended in one of the stops *p*, *t*, *k*, and the Modern Peking stage where this group of words is represented by two separate groups: one with plain vowels, the other with diphthongs. Chen assumes that the vowels of the MC 'entering tone' words were short before the syllable-closing voiceless stops. First, by various changes these stops were reduced to off-glides of the preceding short vowels. At this stage, two competing sound changes became operative: monophthongization, and neutralization of vowel length, the former sending *ǎi/ěi* to *ě*, and *ǎu* to *ǒ*, the latter turning both short and long vowels into neutral plain ones. Schema (6) shows that the output of these changes differs with their order of application, and illustrates at the same time the two Modern Peking groups representing the homogeneous Middle Chinese group of 'entering tone' words in *p*, *t*, *k* (cf. op. cit.: 484).

(6) MC



In MP all diphthongs by Route II are a residue to monophthongization, i.e. neutralization *bleeds* monophthongization in the sense of Kiparsky (1968) conversely, neutralization leaves no residue, it is *counterbled* by monophthongization in Route I. Chen adds that there is also an 'astonishing number of doublets which have both types of pronunciation' (op. cit.: 479).

A refinement of the lexical diffusion-*cum*-competing changes approach to sound change is discussed in the following papers: Wang and Cheng (1970), Chen (1972: 473-5), Cheng and Wang (1972: 99-100). The primary sound change involved in this example is the devoicing of initial consonants from Middle Chinese onwards, which is regular for many dialects, but has left a curiously skewed situation in Shuāng-fēng. Representatives of the originally voiceless consonants are of course still voiceless, but the voiced group is represented by two separate groups: one voiceless, the other voiced. Moreover, the situation is more complex than this when looked upon from the angle of the four MC tone classes. The initial consonants of the original 'entering tone' group (tone IV) have become voiceless at a 84 (voiceless) to 4 (still voiced) ratio, while for the other three tone groups the situation is just the other way about: 2:286 for tone I, 10:90 for tone II, and 20:120 for tone III (together: 32:496). The hypothesis could follow, according to Chen, that the linearly proceeding model of lexical diffusion as in (3), (4), and (7a) below should, at least for some sound changes, be replaced with the curvilinear model of (7b).



In Chen's words (1972: 474-5):

- (8) When a phonological innovation enters a language it begins as a minor rule, affecting a small number of words. The 32 items... which belong to MC tones I, II, and III represent the minority of the vocabulary items affected by the incipient phonological change of devoicing. As the phonological innovation gradually spreads across

the lexicon, however, there comes a point when the minor rule gathers momentum and begins to serve as a basis for extrapolation. At this critical cross-over point, the minor rule becomes a major rule, and we would expect diffusion to be much more rapid. The change may, however, reach a second point of inflection and eventually taper off before it completes its course, leaving behind a handful of forms unaltered. The 4 items of MC tone IV words . . . which retain their voiced initials may be regarded as the residual forms of the receding sound change.

In this view, then, there are two points of 'reflection' where a sound change may stop and leave residue: at the very beginning, before it has enough influence to make the crucial step from minor to major rule,<sup>2</sup> and at the very end when it tapers off and may come to a premature end.

As regards the former, what I will call here the *threshold*-condition on beginning sound change<sup>3</sup> may for instance also explain a situation in Old Icelandic briefly referred to in Vennemann (1972a: 879, fn. 37), where there is a general lowering of short u before dentals, as in *bióða*, *kiósa*, *friósa*, *biórr* vs. *liúga*, *fiúka*, *siúka*, *liúfr* (cf. Ranke-Hofman, 1967: 31; Gordon, 1957: 275, 300), but where there is also a small class of forms with lowering before a non-dental, such as *biófr* (Ranke-Hofman, id.). As regards the latter, in Wang and Cheng (1970) the final 'tapering-off' stage of Shuāng-fēng devoicing is explained by pointing out a competing rule. They formulate the devoicing change as in (9) (op. cit.: 556),

$$(9) \quad [+ \text{voice}] \rightarrow [- \text{voice}] / \# [ \overline{+ \text{obstr}} ] \text{ X } [+ \text{obstr}] \#$$

where X does not contain a morpheme boundary

and assume that the competing change which caused the residue of 4 'entering tone' words is the reduction and subsequent loss through monophthongization of final *p*, *t*, *k* referred to earlier in (6). Thus, also after detailed investigation Wang's MODIFIED REGULARITY HYPOTHESIS is maintained, only with the later proviso of the *threshold*-condition, based on the curvilinear model of lexical diffusion.

### 3. Rule conversion

In 1972, two papers appeared which had as their common subject a linguistic phenomenon (or group of linguistic phenomena) which I will jointly refer to here by the provisional cover-term *rule conversion*. Vennemann's 'Rule Inversion' has since been the basis of several other papers on

the same phenomenon. DeCamp's 'Hypercorrection and Rule Generalization', on the other hand, has, quite undeservedly, attracted very much less attention. As a prerequisite to section 4, I will survey in this present section the contents of both papers, and point out relevant similarities and, more importantly, differences.

Vennemann's aim in 'Rule Inversion' is to motivate as an addition to the list of possible historical changes of grammar so-called *rule inversion*, as he himself points out a type of rule lexicalization, or *restructuring*.<sup>4</sup> He discusses several types of inversion. Apparently most interesting (or 'most typical', 1972b: 240) he finds inversion triggered by the principle of the dominance of semantically primitive categories ('Humboldt's Universal'), which is described as follows (id.):

- (10) Usually in natural language, a semantic derivation of secondary conceptual categories from primitive ones, tertiary from secondary ones, etc., is reflected by a parallel syntactic or morphological derivation . . . Rule inversion occurs if this universally preferred situation is reversed by some historical accident, that is, if a change such as  $y$  occurs in the primitive rather than in the secondary category (i.e. if the conceptually 'unmarked' category is overtly 'marked', the conceptually 'marked' category is overtly 'unmarked') . . .

Schematically (adjusted and simplified from op. cit.: 240):

- |          |                    |                |                    |
|----------|--------------------|----------------|--------------------|
| (11) (i) | Semantic level:    | $A$            | $A + b$            |
|          | Overt level:       | $A + y$        | $A + b$            |
|          | by rule inversion: |                |                    |
| (ii)     | Semantic level:    | $A' (= A + y)$ | $A' + b$           |
|          | Overt level:       | $A'$           | $A' + b + \lambda$ |

where, for present purposes,  $b$  is a 'suffix',  $y$  and  $\lambda$  are (mor)phonological rules, and:  $\lambda$  is the inverse of  $y$  ( $A'$  is the restructured underlying form).

Illustrations of this type of rule inversion take a rather complex form, and since the case of inversion discussed in section 4 is not of this 'typical' type, the reader is referred to Vennemann's paper for examples. At the same time, however, 'Humboldt's Universal' is the only substantive motivation offered by Vennemann behind cases of apparent rule inversion. He weakly and ambiguously touches upon 'the relative frequency of alternants', saying that this is 'undoubtedly' a factor in rule inversion 'although there is so far little evidence to prove this, (op. cit. 236). For some cases of rule inversion, therefore, Vennemann's paper reaches the level of descriptive rather than explanatory adequacy. This includes the so-called *hiatus*

*type* rule inversion, according to Vennemann (op. cit.: 212) 'the most elementary type of rule inversion'. Since the hiatus type rule inversion is relevant to the case discussed in section 3, I will discuss one of Vennemann's examples here.

Hiatus type rule inversion is

- (12) the conversion of a rule of conditioned consonant loss into a rule of consonant epenthesis in the environment which was historically exempted from loss, generalized to similar environments in which no consonants were lost (if such environments exist). Schematically, hiatus rules develop typically as in (6), where C and V represent consonants and vowels respectively.

(6) Stage I.  $C \rightarrow \emptyset / V \text{ — } \# C V$

Stage IIa.  $\emptyset \rightarrow C / V \text{ — } \# V$

in forms characterized as subject to this rule (i.e. in those forms which at stage I had a consonant in that position)

Stage IIb.  $\emptyset \rightarrow C / V \text{ — } \# V$

[as one rule]

Vennemann's example of this type of rule inversion is the case of 'intrusive *r*' in English. The schematic form of this case is obtained by replacing the righthand environment of Stage I in (12, 6) with — (#) {C, #}, and by proceeding further as indicated. Examples of Stage I (= IIa) and Stage IIb of this phenomenon are for instance (cf. Bloomfield, 1933: 417-8):

- |                     |              |              |
|---------------------|--------------|--------------|
| (13) Stage I (IIa): | the water is | the idea is  |
|                     | the wate may | the idea may |
|                     | the wate     | the idea     |
| Stage IIb:          | as above     | the idear is |
|                     |              | the idea may |
|                     |              | the idea     |

Some other illustrations of IIb, righthand column (cf. Gimson, 1962: 204; Maher, 1976):

- |                             |                             |
|-----------------------------|-----------------------------|
| (14) arear of agreement     | lawr and order <sup>5</sup> |
| awr-inspiring               | I sawr it                   |
| Chinar Office               | rawr eggs                   |
| dramar and music            | Russiar and China           |
| drawring-room               | Shar of Persia              |
| Gloriar is a good secretary | the Hondar is a good bike   |
| Indiar and Pakistan         | the Shar of Iran            |

These data are of course very well known, yet they lack 'motivation' ('explanation') within Vennemann's framework. It appears to me that the main reason for this is that in a sense Vennemann deals with only half the story of 'intrusive *r*' (and to this extent one might say that his proposals do not reach the level of descriptive adequacy), and it is by considering this second half that we may gain at least some initial insight into what the motivation will be. For this we must turn to another, much less well known, paper on rule conversion, DeCamp (1972).

Basically, DeCamp's aim is to provide linguistic insight into the social phenomenon of *hypercorrection*. He claims that hypercorrection is linguistically always rule generalization, and that there are two types of hypercorrection viewed linguistically, the one somewhat more obvious than the other. The obvious cases include an example from the Peking dialect. This dialect, which carries relative prestige as compared to other dialects of Chinese, has a rule of retroflexion of diminutive forms which makes, for instance, *hwà* 'painting' become *hwâr*. However, only specific, lexically marked morphemes can be retroflexed; thus, the homophone of 'painting' meaning 'speech' does not retroflex. We have a case of socially hypercorrection and linguistically rule generalization when for instance a Taiwanese uses \**hwâr* meaning 'speech'.

The less obvious case of rule generalization, and presently the more interesting, 'might be called *rule symmetry*, the development of mirror-image rules' (emphasis by D.D.<sup>6</sup>). DeCamp's example of rule symmetry is then indeed the missing half of the 'intrusive *r*' phenomenon in English (op. cit.: 88):

- (15) In San Francisco, *r*-dropping is . . . strongly disapproved of by most speakers. Among the vehement critics of such 'careless, Okie' pronunciations without *r*, there was a gentleman who talked about the *parm* of his hand. Socially this is indeed hypercorrection, but what is happening here linguistically? Certainly it is not another simple case of rule generalization, for the relevant rule is *r*-dropping, which does not carry the prestige necessary to cause generalization. Quite the opposite: it is *failure* to *r*-drop that carries prestige. What is over-generalized is the converse of the rule.

and he notes that the 'converse of the rule' (op. cit.: 88-9):

- (16) seldom remains perfectly symmetrical, however. Specifically, it is especially susceptible to rule generalization. A rule perfectly symmetrical to *r*-drop would simply restore the *r* in exactly those words from which it had been dropped. But how can those words be identified? If *r*-dropping after /a/ results in a long /a:/, how can the symme-



trical rule distinguish between those long /a:/s which had been *r*-ful and those which had never contained an *r*, e.g. *palm*, *calm*, *balm*? Because *palm* rhymes with *farm* after *r*-dropping, the words like *palm* would all have to be lexically marked as not susceptible to the *r*-insertion rule. The pronunciation *parm* is thus also a case of rule generalization – not of the original offensive rule but of the symmetrical *r*-reinsertion rule.

Now consider how DeCamp's notion 'converse' in (15) differs from Vennemann's 'conversion' in (12). For the latter, apparently, 'conversion' entails the interchange of focus<sup>7</sup> and structural change of a rule *and the replacement of the environmental condition by its 'complement'*, for instance {C, #} as the complement of *V*. For the former, apparently, 'converse' entails the very same interchange *but no change at all in the conditioning of the rule*. Schematically, therefore, Vennemann's *rule inversion* and DeCamp's *rule symmetry* compare as in (17).

(17) (i) *rule inversion*

Stage I:	$r \rightarrow \phi / V \text{ — } (\#) \{C, \#\}$	water is — idea is
Stage IIa:	$\phi \rightarrow r / V \text{ — } (\#) V$	water is — idea is
	with lexical markings	
Stage IIb:	same rule, no markings	water is — idear is

(ii) *rule symmetry*

Stage I:	same as stage I above	wate — idea
Stage IIa:	addition of	
	$\phi \rightarrow r / V \text{ — } (\#) \{C, \#\}$	water — idea
	with lexical markings	
Stage IIb:	same rule, no markings	water — idear

As (17, ii) shows, DeCamp proposes technically that the 'symmetrical' rule is added to the grammar immediately after the original rule, rather than that it replaces that rule. This seems trivial, but in actual fact there is a sound reason behind this proposal. Specifically, he suggests that (op. cit.: 89):

- (18) these symmetrical rules, whether or not generalized, are part of the mechanism of style acquisition, wherein a speaker who is acquiring a new style is more likely to add a new rule, even a symmetrical rule which simply undoes the effect of another rule, rather than to delete a rule, change a rule, or reorder rules.

Indeed, the following contours of the phenomenon of 'intrusive *r*' in English as regards rule conversion now emerge. Let us distinguish between

two general groups of native speakers of English, or rather two general sorts of 'attitude' of these speakers toward the original phenomenon of *r*-deletion. One group of speakers, which may be called the 'positive' group (or in inaccurate though suggestive terminology the *extension* group, cf. Kiparsky, 1968: 201), will take any opportunity at hand to use *r*-deletion. *Vice versa*, the other group will be the 'negative' group (or, within the alternative terminology, the *leveling* group), and they will take any opportunity they can to avoid the same rule. From the above it will be clear that with each group corresponds one type of *rule conversion*. For the former, *extension* group, the desire to create the alternation effectuated by the rule as much as possible will lead to the addition to the grammar of an inverted rule in the sense of Vennemann. For the latter, *leveling* group, disapproval of the very same alternation will lead to the addition to the grammar of a symmetrical rule in the sense of DeCamp. (17) makes this already clear: the developments under (i) lead to more cases of the alternation effectuated by the original rule of *r*-deletion, while conversely the developments under (ii) precisely avoid the alternation effectuated by the rule. In yet another schema, this may be represented as in (19).

(19) (i)	/ water is /	/ water /	/ idea is /	/ idea /
<i>r</i> -del	—	$\phi$	—	—
approval leads to addition of:				
invers	—	—	<i>r</i>	—
output:	water is	wate	idear is	idea
(ii)	/ water is /	/ water /	/ idea is /	/ idea /
<i>r</i> -del	—	$\phi$	—	—
disapproval leads to addition of:				
symm	—	<i>r</i>	—	<i>r</i>
output:	water is	water	idea is	idear

(19, ii) represents (an extrapolation of) the situation described by DeCamp for San Francisco.<sup>8</sup> Situation (19, i) has recently been described by Kahn (1976: 66-72) for New York, after Kurath (1974: 76), and especially Labov (1966; 1972: ch. 2). In New York *r* appears before a vowel both in *tuner is* and often 'intrusively' in *tunar is* (but never in *tuna seems*). This argues that the dialect has an *inverse* rule of intervocalic *r*-epenthesis. However, over and above this, the dialect has retained *r*-full underlying forms, plus the original 'sound change' of *r*-deletion in the form of a 'variable rule', since in

(20) words like *tuner* (when not before a vowel-initial word) and *card*,

the percentage of retention of /r/ varies from a few per cent to near 100% [while New York speech] has exactly 0% occurrence of /r/ in *tuna* (when not before a vowel) and *cod*. (Kahn, 1976: 72)<sup>9</sup>

I would like to propose, then, that it is the difference between the, essentially social, attitudes toward the original rule of *r*-deletion in English which leads to ('explains') the two types of rule conversion and their empirical differences.

Two final sideways related points may be in order. First, an approach which links at least 'hiatus type' rule inversion to social attitude makes claims which can be confirmed or disconfirmed by test. For instance, the claim follows from the framework presented here that a sound change which is generally disapproved of may drag along hypercorrect forms of the symmetry-type, and conversely: hypercorrection of the symmetry-type is an indication of a negative attitude (similar claims may be constructed for the positive attitude). These claims may be briefly illustrated with the help of a sound change of Dutch, which will also feature in section 4, and which I will refer to as SPIRANTIZATION.

Although this is a simplification, SPIRANTIZATION turns intervocalic *d* into *j* when the rightmost vowel is suffixal shwa (with the additional side-effect of generating *w* after the diphthong *ou*, for details cf. Zonneveld, 1978). In Western Dutch (specifically, the non-dialect Dutch of the provinces of North- and South-Holland) the output of SPIRANTIZATION is generally considered substandard ('plat'): *rooie* [ro:jə], for instance, is substandard for *rode* [ro:də] 'red, attr.'. Within the framework presented here the prediction is made that, if we find rule-conversion, it will be of the symmetry-type rather than the inversion-type. On the other hand, in Flemish Dutch, which is in fact the historical source of the SPIRANTIZATION rule (see below), the spirantized forms are much less stigmatized. Within the present framework the prediction is made, therefore, that if we find rule-conversion in Flemish, it will be of the inversion-type rather than the symmetry-type. These two situations are set out in (21), where *kooi* means 'cage', and *kooi-e* is its plural.

- |          |                                |          |            |          |            |
|----------|--------------------------------|----------|------------|----------|------------|
| (21) (i) | <i>inversion</i>               | / rood / | / rood-e / | / kooi / | / kooi-e / |
|          | spir                           | —        | j          | —        | —          |
|          | approval leads to addition of: |          |            |          |            |
|          | invers                         | —        | —          | d        | —          |
|          | output                         | rood     | rooj-e     | kood     | kooj-e     |
| (ii)     | <i>symmetry</i>                | / rood / | / rood-e / | / kooi / | / kooi-e / |
|          | spir                           | —        | j          | —        | —          |

disapproval leads to addition of:

symm	—	<i>d</i>	—	<i>d</i>
output	<i>rood</i>	<i>rood-e</i>	<i>kooi</i>	<i>kood-e</i>

The predictions are, as far as I am aware, confirmed. In Western Dutch one does not find hypercorrection of the inversion-type, while one does find hypercorrection of the symmetry-type. Among others, one may actually hear from time to time hypercorrections such as:

- (22) *beeldhouden* for *beeldhouwen* [*-hauwə*] ‘to sculpture’  
*breiden* for *breien* [*breijə*] ‘to knit’  
*eiderkoek* for *eierkoek* [*ɛijər-*] ‘egg-cake’  
*jubiledum* for *jubileum* [*-e:jəm*] ‘jubilee’  
*koeden* for *koeien* [*kujə*] ‘cows’  
*tweederlei* for *tweeërlei* [*-e:jər*] ‘of two kinds’  
*vrouden* for *vrouwen* [*vrauəwə*] ‘women’  
*aanshouden* for *aanschouwen* [*-sɔauwə*] ‘to observe’

and so on. Conversely, of course, we might have predicted the negative attitude from these data.

For Flemish relevant data<sup>10</sup> have been reported in Peters (1937), De Schutter (1968), and Van Loey (1971). Here one finds typically rule *inversion* with, for instance, *blaud-blauwe* for Western Dutch *blauw-blauwe* ‘blue, pred.-attr.’, and similarly *graud-grauwe* ‘gray’, and *raud-rauwe* ‘raw’. Furthermore, the Western Dutch noun *stro* (from /strooi/ because of adjectival *strooien* ‘made of straw’ has been reported as *strood* for Flemish. Again conversely, we might have predicted the positive attitude from these data.

Secondly, viewed as above, rule conversion in the ‘intrusive *r*’ phenomenon in English does not constitute a case of rule lexicalization of restructuring in the sense of the earlier type conditioned by ‘Humboldt’s Universal’. As (19) and (21) show, no modification of underlying forms is involved in the conversion process itself. Rather, we have a case of another well-known type of linguistic change, *rule addition* or *innovation*.<sup>11</sup> This is not to say, of course, that the addition of a converted rule cannot indirectly, at a second stage, lead to restructuring. The close ties between innovation and restructuring were already discussed in Kiparsky (1965: 3-11) who together subsumes them under *sound change*. (Traditionally, such a two step analysis – in this case innovation followed by restructuring, rather than simultaneous conversion and restructuring – would be attributed to ‘Polivanov’s Law’, cf. Jakobson, 1962: 215-6). It will in fact follow from section 4 that an inverted sound change in Dutch has caused restructuring in at least some cases.

4. *The Looking Glass War*

Given sections 2 and 3, the contents of the present, fourth, section will be as follows. If Wang's MODIFIED REGULARITY HYPOTHESIS makes sense, and if the notion RULE CONVERSION as developed in the previous section makes sense, it may become plausible to at least entertain the idea of a sound change being competed against by its own converse. More specifically, it may be put thus. The original REGULARITY HYPOTHESIS plainly forbids a sound change to leave residue, i.e. it predicts that as the change ceases to be operative, there will be no form(s) left to deny it. Wang's tag to the hypothesis allows residue in one and only one clearly defined circumstance: in case of *competing changes*. By adding the tag, Wang eliminates ('explains') at least one class of potential counterexamples to the regularity hypothesis, and hence the situation is still disallowed where a sound change withers away, just by itself and uncompleted with, *and* leaves residue. This theory being put to the test, the *threshold condition* was called upon to explain the curiously lopsided situation as regards initial devoicing in Shuāng-fēng: a sound change must be strong enough so as to take the critical step from minor to major rule; if not, it will be able to affect only a small handful of forms, and give up. Still, the situation just described is disallowed.

It will be my aim in this section to make plausible the proposal that one further class of apparent counterexamples to the regularity hypothesis can be eliminated ('explained') if we allow for a sound change to be in competition with its own converse. I will illustrate the empirical consequences of this proposal through discussion of an apparently incomplete sound change in Dutch, the outcome of which is traditionally described as 'complex' and 'chaotic', as for instance in the following typical passage from Leenen (1953: 58).<sup>12</sup>

- (23) The process is not an unfinished symphony, but has remained an unfinished performance, interrupted at the stage of chaos. A process in the spoken language is stopped, its complete development inhibited by the written language. The outcome is the current picture of confusion.

Before I embark upon the illustration, two preliminary points should be made for clarification. In the first place, let me point out that the proposal made here does not necessitate further refinements of the (MODIFIED) REGULARITY HYPOTHESIS. Rather, if we allow for sound change to be competed against by its own converse, the (MODIFIED) REGULARITY HYPOTHESIS will be correct as in (1). My second preliminary remark

will be more elaborate. Specifically, although it appears at first glance, with reference to (19) and (21), that a sound change may be competed against by two types of converses (its inverse mate, or its symmetrical mate), this is in fact, or rather by definition, not true: inversion of the Vennemann-type can indeed never lead to competition by definition, since the environments of the rules involved are *complementary*, hence mutually exclusive. Perhaps superfluously, the two possible orders of the rules are set out in (24), which shows that the respective outputs are identical.

(24) *rule inversion*

order I:	/ water is /	/ water /	/idea is /	/ idea /
<i>r</i> -del	—	$\phi$	—	—
invers	—	—	<i>r</i>	—
output	water is	wate	idear is	idea
order II:	/ water is /	/ water /	/ idea is /	/ idea /
invers	—	—	<i>r</i>	—
<i>r</i> -del	—	$\phi$	—	—
output	water is	wate	idear is	idea

There appears to be some intuitive rationale behind this observation: recall that this type of rule-conversion represents the ‘positive’, extension type of conversion of section 3. Thus, if some sound change is (socially) approved of, why should it be hindered by competition? Notice that this is not to say, i.e. our theory does not make the prediction, that *r*-deletion as a sound change in the relevant dialects of English will necessarily be regular: in the end there may always be some other, independent sound change to compete against it.

On the other hand, a competition situation does arise in DeCamp-type conversion (symmetry) where, again by definition, the two environments are identical. As is shown in (25), in this case the output differs per ordering relation.

(25) *rule symmetry*

order I:	/ water is /	/ water /	/ idea is /	/ idea /
<i>r</i> -del	—	$\phi$	—	—
symm	—	<i>r</i>	—	<i>r</i>
output	water is	water	idea is	idear
order II:	/ water is /	/ water /	/ idea is /	/ idea /
symm	—	—	—	<i>r</i>
<i>r</i> -del	—	$\phi$	—	$\phi$
output	water is	wate	idea is	idea

The 'intrusive *r*' phenomenon in English, which I have used throughout this paper for illustrative purposes is, as far as I am aware, contemporarily very much alive in English both as regards approval and disapproval, and this makes it very difficult to make hard and fast predictions as to its eventual fate. As just pointed out, even for the 'extension' group some independent competing change may come along to make *r*-deletion leave residue, and for all we know the 'negative', 'leveling' group could revise its attitude, and so forth. For such reasons, it appears wisest to try and seek a real test for our hypothesis further back in time, to see whether we can make sense out of things that have more or less settled and calmed down, especially things that have hitherto baffled serious investigators. As an investigation of this type, I offer the following description of a piece of the linguistic history of Dutch.

In contemporary Modern (Western) Dutch, intervocalic *d* is affected in two ways: before suffixal shwa it becomes spirantized (see above), and within morphemes it gets deleted, where the morpheme loses a syllable in the process.<sup>13</sup> Examples of these phenomena are displayed in (26):

(26) (i) *deletion*

<i>ader</i>	– <i>aar</i>	'vein'
<i>heide</i>	– <i>hei</i>	'heath'
<i>lade</i>	– <i>la</i>	'drawer'
<i>leder</i>	– <i>leer</i>	'leather'
<i>mede</i>	– <i>mee</i>	'with'
<i>moede</i>	– <i>moe</i>	'tired'
<i>slede</i>	– <i>slee</i>	'sledge'
<i>weide</i>	– <i>wei</i>	'meadow'

(ii) *spirantization*

<i>breed</i>	'wide'	– <i>breder/breeër</i>	'wider'
<i>goed</i>	'good'	– <i>goede/goeie</i>	'good, attr.'
<i>glijd</i>	'slide, lsg.'	– <i>glijden/glijen</i>	'to slide'
<i>kleed</i>	'rug'	– <i>kleden/kleeën</i>	'rugs'
<i>koud</i>	'cold'	– <i>koude/kouwe</i>	'cold, attr.'
<i>kruid</i>	'herb'	– <i>kruiden/kruien</i>	'herbs'
<i>kwaad</i>	'angry'	– <i>kwade/kwaaie</i>	'angry, attr.'
<i>oud</i>	'old'	– <i>oude/ouwe</i>	'old, attr.'
<i>rijd</i>	'drive, lsg.'	– <i>rijden/rijen</i>	'to drive'
<i>rood</i>	'red'	– <i>rode/rooie</i>	'red, attr.'

The alternating forms in (26, i) differ in that the left-hand ones are bisyllabic with *de* [də], whereas the righthand ones are monosyllabic

without *de*. This difference will be bridged by a rule of CONTRACTION, performing just the required deletion of *de*. The alternating forms in (26, ii) differ in that the left-hand ones have *d* where the right-hand ones have *j*, or *w* after *ou*. *j* is represented in three different ways orthographically: by *i* after back vowels; by a diaeresis over suffixal shwa after front vowels; and by *zero* after diphthongs (*ei* and *ui*). The difference between *d* and *j/w* will be bridged by SPIRANTIZATION.

There are, in this particular case, at least four reasons why synchronically the data in (26) cannot be handled by, say, the obvious analysis with general intervocalic *d*-deletion plus intervocalic *j*-insertion on the suffix boundary. These reasons are described elaborately in Zonneveld (1978), and may be repeated briefly as follows: (i) as indicated above, SPIRANTIZATION depends consistently on style of speech (tempo, etc.); CONTRACTION does not (this argues that SPIRANTIZATION is synchronically a 'variable rule' in the sense of Labov, 1971, 1972; see also Chen, 1974: 70-1); (ii) in some cases, some of them given in (26), CONTRACTION is accompanied by a sometimes slight, then again more pronounced modification of meaning (this argues that synchronically CONTRACTION is a lexical rule, perhaps a 'via rule' in the sense of Vennemann, (1972b):

(27) <i>boedel</i>	'estate, property'	– <i>boel</i>	'lot, large amount'
<i>buidel</i>	'pouch'	– <i>buil</i>	'lump'
<i>ijdel</i>	'vain'	– <i>ijl</i>	'thin'
<i>moeder</i>	'mother'	– <i>moer</i>	'female screw, nut, female animal'
<i>prediken</i>	'to preach'	– <i>preken</i>	'to preach, to moralize'
<i>teder</i>	'tender'	– <i>teer</i>	'delicate'
<i>vergaderen</i>	'to assemble'	– <i>vergaren</i>	'to collect'

SPIRANTIZATION is never accompanied by such changes in semantics; (iii) SPIRANTIZATION is much more productive vis-à-vis CONTRACTION in the sense that the latter depends heavily on *ad hoc* mechanisms in order to derive all grammatical forms and only these; although the actual range of data is infinitely more complex, a small series of three current Dutch words from historically the same base will suffice to illustrate this point: *buidel* 'pouch', *buil* 'lump', *theebuיל* 'teabag'; (iv) finally, for some nouns plural formation depends on ('is ordered after') CONTRACTION, since the plurals of the contracted and non-contracted forms



differ, although regularly so: for instance, *laden* is the plural of *lade*, but *la's* that of *la*. On the other hand, SPIRANTIZATION depends on ('is ordered after') plural formation, since the vowel of the plural suffix *-en* can be its righthand environment, as *kleden/kleeën* and *kruiden/kruien* in (26, ii) show.

Taken together, these four observations argue for CONTRACTION and SPIRANTIZATION as separate rules of contemporary Modern Dutch. While this describes the synchronic situation, it was argued by the Dutch grammarian Van Haeringen (1926, 1927) that also diachronically CONTRACTION and SPIRANTIZATION are independent processes. After a very detailed study of Dutch literary texts he arrives at the conclusion that CONTRACTION was probably a 'native' Dutch process, while SPIRANTIZATION came northward from Flanders (Antwerp) from the sixteenth and seventeenth centuries onwards. To the best of my knowledge, this position has never been challenged, although De Vries (1928) argues that at least some SPIRANTIZATION cases may have been native. Evidence corroborating Van Haeringen's findings is adduced by Van Loey (1952, 1953). In view also of the synchronic situation I assume Van Haeringen's hypothesis to be correct. This assumption, of course, begs the question why Dutch should have (had) such obviously similar but independent sound changes at all, but for the sake of expositional clarity and, I should add, to a large extent because of sheer ignorance, I will leave these matters at this highly inconclusive stage.

Under these preliminaries, let me, for ease of reference, state the rule informally as in (28), where VV represents long vowels and diphthongs (no CONTRACTION takes place after short vowels, for instance *wedde* 'salary' > \**we*).

(28)  $de > \phi / V V \text{ —}$

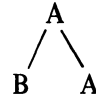
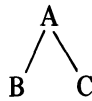
Broadly speaking, the two stages of the history of Dutch to be accounted for vis-à-vis this rule is a stage I with just its input, and a stage II with essentially three groups of forms: (i) forms to which CONTRACTION as a sound change has successfully applied (as in (29, i)); (ii) forms to which CONTRACTION has not applied at all (as in (29, ii)); and (iii) forms fluctuating between application and non-application of CONTRACTION, in this case divided into two subgroups: with semantic change (27), and without semantic change (26, i).

- (29) (i) *beul* 'executioner' (< \**bodele*), and similarly:  
*beuling* 'sausage' *laars* 'boot'  
*bleu* 'shy' *mierik* 'horse-radish'

<i>gedwee</i>	'submissive'	<i>reu</i>	'male dog'
<i>graag</i>	'eager'	<i>peuren</i>	'to sniggle'
<i>hou</i>	'loyal'	<i>sneu</i>	'disappointing'
<i>keu</i>	'hog'	<i>slieren</i>	'to slide'
<i>kiel</i>	'blouse'	<i>tra</i>	'clearing'
<i>kuil</i>	'cod-end'	<i>vlerk</i>	'wing'
<i>kwee</i>	'quince'	<i>vlijm</i>	'lancet'
<i>lee</i>	'water'	<i>weegbree</i>	'plantain'
(ii)			
<i>bedelen</i>	'to beg'	<i>made</i>	'maggot'
<i>blijde</i>	'ballista'	<i>poedel</i>	'poodle-dog'
<i>bode</i>	'messenger'	<i>rede</i>	'sense'
<i>breidel</i>	'rein'	<i>reden</i>	'reason'
<i>dadel</i>	'date'	<i>schade</i>	'shadow'
<i>gestade</i>	'riverbank'	<i>wade</i>	'shroud'
<i>heiden</i>	'pagan'	<i>wede</i>	'woad'
<i>hoede</i>	'guard'	<i>wederik</i>	'loosestrife'
<i>loeder</i>	'skunk'	<i>woede</i>	'anger'

(cf. Schönfeld, 1970: esp. 33-6). Within the terminology of section 2, CONTRACTION as a sound change of Dutch has clearly left residue. Given the framework described and illustrated there, there are two general circumstances through which residue can emerge: (i) by competition, as in Peking monophthongization; and (ii) as a result of the threshold condition, as in Shuāng-fēng devoicing for tone-classes I-III. As regards the former, we may observe an important similarity between the output contours of Peking monophthongization and Dutch CONTRACTION in the three groups characterized by non-application, optional application, and obligatory application, respectively. This similarity indicates that, as Peking monophthongization, CONTRACTION has proceeded along the dimensions of temporal and lexical gradualness. However, there is a more important difference; in the Peking case, those forms characterized by the non-application of monophthongization (either optionally or obligatorily) are further characterized by the application of the competing change of neutralization, which for these forms *bleeds* monophthongization. In the present Dutch case, no such further characterization is obvious, since the forms to which CONTRACTION has not applied have the characteristics of its input, not those defined by the output of a rival sound change. Schematically, therefore, the initial and final stages of these sound changes compare as in (30).

(30) (i) Peking monophthongization (ii) Dutch contraction



As regards the threshold condition, which should be typically applicable for a representation such as (30, ii), some very informal statistics performed on the data relevant to CONTRACTION as a sound change lead to figures which may turn out to be slightly inaccurate absolutely, but comparatively meaningful: the ratio 'unaffected:optionally affected:affected' found in a corpus of 145 words relevant to the history of CONTRACTION (compiled with the help of the usual contemporary, inverse, and historical dictionaries) was 44:65:36. Since also no phonological subenvironment of CONTRACTION shows figures differing significantly from these, acceptance of this ratio as resulting from the threshold-condition would clearly reduce this condition to near vacuity (recall that the ratio initially motivating the threshold-condition was 32 vs. 496 for application vs. non-application, cf. above).

Both the just-mentioned informal figures and schema (30) are disturbing. In fact, they look suspiciously like the characteristics one expects to find for a sound change which has indeed stopped midway, *both* past the threshold, *and* uncompleted with. Put in its simplest form, when faced with such a situation, there are two logically possible attitudes one can take: (i) one claims that by unearthing this example, and by taking it as a counterexample to the REGULARITY HYPOTHESIS, one has made an interesting (although admittedly unfortunate) contribution to linguistics: a hypothesis valid for at least some range of facts is overthrown in the face of further empirical data. A much more interesting position, however, is (ii) where one claims, in spite of distressing figures and schemata, that the sound change at hand is *not* a counterexample to the hypothesis. This position has again two variants: (i) one adds a new tag to the REGULARITY HYPOTHESIS, defining explicitly the circumstances under which a sound change can take the form of Dutch CONTRACTION; and (ii) (again more interesting) one does not add another tag to the hypothesis, but rather one shows that the contours of CONTRACTION follow from assumptions independently present in one's theory of phonological change. It is the latter course I claim is indeed possible for Dutch CONTRACTION. To this end, consider the following.

Let us assume that at some point in history the rule of CONTRAC-

TION (28) was added to the grammar of Dutch.<sup>14</sup> Since CONTRACTION, as an intramorphemically conditioned sound change, does not lead to paradigmatic alternation, if it is met by a 'positive' attitude, we may assume that it will simply run its course (in the way of lexical diffusion) and end up as a regular sound change in the sense of the REGULARITY HYPOTHESIS. But as we have just seen, CONTRACTION did not in fact run its full course: it was somehow prevented from reaching all the forms it potentially could, and it left residue. The theory of sound change described in section 2 allows two situations where residue may occur: (i) as a result of the threshold-condition and (ii) as a result of rule-competition. We have already observed that the former does not work in this particular case, so if we are to take ourselves seriously we are forced to explain the residue left by CONTRACTION as resulting from interaction with a competing rule. Schema (30) again seems to take the heart out of this possibility, but then suppose we have a case of making four equilateral triangles with only six matches: the key to the situation lies in adding another dimension. In this particular case, I claim the other dimension lies in allowing CONTRACTION to be competed against by its own converse. Allowing for this possibility as a form of linguistic change will permit us to explain the contours of CONTRACTION as a sound change apparently stopped midway, and more. In particular, I will assume that (28) (repeated here as (31, i)) was in competition with its symmetrical converse (31, ii) during some period of the linguistic history of Dutch.

- (31) (i)  $de > \phi / V V \text{ —}$   
 (ii)  $\phi > de / V V \text{ —}$

Schematically, taking *heide* 'heath' from (26, i) as an example, this competing situation can be represented as in (32).

- |          |              |          |            |
|----------|--------------|----------|------------|
| (32)     | / heide /    |          | / heide /  |
| (31, i)  | $\phi\phi$   | (31, ii) | —          |
| (31, ii) | $de$         | (31, i)  | $\phi\phi$ |
| output   | <i>heide</i> | output   | <i>hei</i> |

One may have observed, though, that thus far the assumption of a competition relation between CONTRACTION and its converse is empirically tantamount to the claim that CONTRACTION as a sound change stopped halfway. Both theories in fact predict that the three groups described earlier as the groups of 'non-application, optional application, and obligatory application' will occur, and both theories are confirmed in this respect. However, there is one important point at which the two theories

differ: the conversion theory, by assuming (by hypothesis) (31, ii), makes the prediction that we will find 'hypercorrection' in forms where *-de-* is inserted into forms which do not originally contain *-de-*. The rival theory of midway death does not make this prediction, and is therefore the weaker theory. Schematically, the prediction of the former, stronger, conversion-theory can be represented as in (33), where *zee* means 'sea'.

(33)	/ zee /	/ zee /
(31, i)	-	(31, ii) <i>de</i>
(31, ii)	<i>de</i>	(31, i) $\emptyset\emptyset$
output	<i>zeede</i>	output <i>zee</i>

In actual fact, the prediction made by the stronger conversion-theory is borne out by the linguistic history of CONTRACTION. At least during some period of time, hypercorrection resulting from CONTRACTION as a disapproved of sound change appears to have been extremely common. It is reported on in several articles among the vast literature on intervocalic *d* in Dutch, notably Van Wijk (1907), De Vooys (1928), Verdenius (1946), and Mak (1965). Furthermore, hypercorrections with intervocalic *d* are noted in Te Winkel (1884: 262-6), Franck (1910: 104), Van Haeringen (1927: 152) and Schönfeld (1970: 40).

Te Winkel, Franck, Schönfeld, and Van Wijk report on hypercorrection from the fourteenth century onwards in verbs such as those in (34, i), and nouns as in (34, ii).

(34) (i)	<i>(be)liden</i>	for	<i>(be)lien</i>	'to confess'
	<i>(be)vrijden</i>		<i>(be)vrien</i>	'to liberate'
	<i>castiden</i>		<i>castien</i>	'to chastise'
	<i>gescieden</i>		<i>gescien</i>	'to happen'
	<i>greiden</i>		<i>greien</i>	'to please'
	<i>spieden</i>		<i>spien</i>	'to spy'
	<i>tieden</i>		<i>tien</i>	'to go'
	<i>tieden</i>		<i>tieën</i>	'to blame'
	<i>vermeiden</i>		<i>vermeien</i>	'to have fun'
	<i>vertiden</i>		<i>vertien</i>	'to give up'
	<i>vlieden</i>		<i>vlien</i>	'to flow'
	<i>widen</i>		<i>wien</i>	'to consecrate'
(ii)	<i>clydere</i>	for	<i>cliere</i>	'gland'
	<i>corweide</i>		<i>corweie</i>	'labour'
	<i>cyteide</i>		<i>cité</i>	'city'
	<i>diede</i>		<i>die</i>	'thigh'

<i>galeide</i>	<i>galeie</i>	'galley'
<i>lijde</i>	<i>lie</i>	'lee'
<i>puide</i>	<i>pui</i>	'shop-front'
<i>rade</i>	<i>ra</i>	'yard'
<i>valeide</i>	<i>valeie</i>	'valley'
<i>widel</i>	<i>wiel</i>	'veil'
<i>woekerijde</i>	<i>woekerie</i>	'profiteering'

Te Winkel and Van Haeringen provide the following examples from the sixteenth century dictionary of Kiliaen:

(35)	<i>vlaeden</i>	for	<i>vlaen</i>	'to wash'
	<i>vleiden</i>		<i>vleien</i>	'to flatter'
	<i>vrijden</i>		<i>vrijen</i>	'to make love'

Mak mentions hypercorrection such as *zeede* for *zee* 'sea' (cf. (33)), *sneede* for *snee* 'snow', and *naede* for *nae* 'after' from the sixteenth century diary of Wouter Jacobsz. He adds that the diary contains many more examples. Te Winkel and De Vooy's give several cases from the works of the seventeenth century writer Joost van den Vondel, such as *dwaden* for *dwaen* 'to wash', and *marteladeren* for *martelaren* 'martyrs'. From other sources De Vooy's adds *ader* for *aar* 'ear of corn', and *sweeder* for *sweer* 'brother-in-law'; Verdenius adds *wedermacht* for *weermacht* 'fighting services'.

Of these examples, as may be expected some words have simply vanished from the Dutch lexicon in the course of time, such as *grei(d)en*, *wi(d)el*, and others. Of those still in contemporary use, especially the hypercorrections among the nouns have not survived. Among the verbs, however, there are several with 'unetymological' *d* which in contemporary Modern Dutch have this *d* in their respective underlying forms, since there is not any longer an alternation between *zero* and *d* (and there appears to be no reason to surpass *d* in going more abstract). Among these verbs are, for instance, *kastijden* and *geschieden*, which behave morphologically as in (36).

(36)	infinitive:	<i>kastijden</i>	<i>geschieden</i>
	sg. pres.:	<i>kastijd</i>	<i>geschied</i>
	sg. past:	<i>kastijdde</i>	<i>geschiedde</i>
	past part.:	<i>gekastijd</i>	<i>geschied</i>
	<i>kastijder</i>	'castigator'	<i>geschiedkundig</i> 'historical'
	<i>kastijding</i>	'castigation'	<i>geschiedenis</i> 'history'

Apparently, then, for these verbs *restructuring* has taken place.

In brief, the proposals put forward here imply that schematically CONTRACTION as a sound change in Dutch has developed through time as in (37).

(37) ('simplification and telescoping')

⇓⇓

stage I:  $de > \phi / V V \text{ —}$   
 stage II: addition of symmetrical rule

ROUTE I

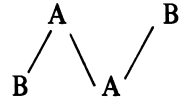
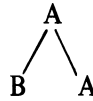
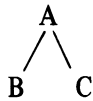
	<i>heide</i>	<i>zee</i>
contr	$\phi\phi$	—
symm	<i>de</i>	<i>de</i>
output:	<i>heide</i>	<i>zeede</i>

ROUTE II

	<i>heide</i>	<i>zee</i>
symm	—	<i>de</i>
contr	$\phi\phi$	$\phi\phi$
output:	<i>hei</i>	<i>zee</i>

In yet another schema, competition between converse rules may be represented as in (38, iii), where (i) and (ii) are taken from (30).

(38) (i) non-converse competition      (ii) threshold condition      (iii) converse competition



Several comments and refinements on the contents of the proposals as regards converse rule competition may be in order. In the first place, notice that the set up as presented (schematically as in (37) and (38)) does not provide a reason ('motivation', 'explanation') for *why* either the original sound change of CONTRACTION or its symmetrical converse eventually died (i.e., became 'unproductive'), which they evidently did. Thus, if either or both were still alive in contemporary Modern Dutch, one would expect more forms to become subject to it (them), perhaps including loans, but this does not happen. The set-up does not explain this, nor is it intended to. Rather, given the decease of both CONTRACTION and its converse, the proposal of allowing rules to be competed against by their converses is part of an attempt to explain residue otherwise unexplained: on the one hand exceptions to the sound change *per se*, on the other the group of hypercorrect forms.<sup>15</sup>

Secondly, I should like to emphasize that the picture presented here of the history of CONTRACTION as a sound change of Dutch, especially as

regards schemata (37) and (38) is doubtlessly grossly oversimplified. For instance, I should point out in this respect that both CONTRACTION and its converse will originally have had constraints imposed upon them which follow not at all from the overly general formulations of (28), (31), and (37). In particular, if we assume that CONTRACTION, as a sound change in progress, was at least during some period of time constrained by variable conditions of the Labov (1971)-type, which may be said to define 'strength' of the rule per phonological subenvironment, we explain why the converse rule adds *de* only in those environments where CONTRACTION itself deletes it. In other words: 'hypercorrection' is found only in CONTRACTION-environments (typically in fact before *r*, *l* and #), not after just *any* *VV* sequence from whatever source. One never finds hypercorrection before *p*, for instance (*knijp* > \**knijdep*), since *p* is not a subenvironment of the original rule of CONTRACTION.

Thirdly, notice that by allowing for a disapproved sound change to be competed against by its converse one does not simultaneously make the further step of predicting that each disapproved of sound change will in fact be competed against by its converse. It is only, so the proposal goes, when one observes a certain, explicitly defined range of data, *hypercorrection* to be precise, that one knows that a converse rule is involved. Another means perhaps available to dispose of a disapproved of sound change is simply the deletion of the specification on a word marking it as subject to the change. In such a case, eventually also the sound change as a synchronic rule will be lost from the grammar. Apparently, two cases of sound change discussed in the literature on lexical diffusion and competing changes are of this type. The former is mentioned in Wang (1969: 16, fn. 14), in a quote from Sturtevant (1917: 76):

- (39) In Latin there was at one time a tendency to lengthen short vowels before *gn* . . . But . . . the pronunciation with a short vowel finally prevailed. In this case the net result of the incipient sound change was to leave things as they were first.

The latter is given in Chen and Wang (1975: 262-3), with reference to Janson (1973):

- (40) [Janson] deals with the loss of final *-d* in many words in Stockholm Swedish. In words like *ved* 'wood', *hund* 'dog', *blad* 'leaf', and *röd* 'red', Stockholmers usually delete the *-d* in ordinary speech. This fact has been thoroughly checked out by Janson, both by sampling opinions from sophisticated informants and by monitoring taped speech. The point of special interest here is that the class of words that can undergo optional *-d* deletion is now much smaller than it was, say, a



half-century ago, as determined from earlier descriptions. It is believed that the final *-d* was disappearing, in some Swedish dialects, as early as the 14th century. In Stockholm speech, the deletion used to be possible for many more words, across several more grammatical categories. However, since it has been kept in the orthography, the resurgence of *-d* probably came as a result of the rapid rise in literacy in Sweden in recent decades.

Here we have a case of lexical diffusion suddenly reversing its course stimulated by social change.

Furthermore, Eikel (1966: 259-60) in a brief study of the German dialect spoken in New Braunfels refers to a case mentioned in Viëtor (1915: 208-9) involving the spirantization of velar [g] to a fricative in Inlaut and Auslaut position in Modern German (for further discussion of this rule cf. Kiparsky 1965: 43, and 1968: 199; Koutsoudas, Sanders, and Noll 1974: 24-5). The relevant passage in Viëtor (1915) runs as follows:

- (41)... früher [war] in diesem Buche (1.-4. Aufl.) wie z.B. auch in meiner 'Ausspr. des Schriftd.' (1.-3. Aufl.) dem in- und auslautende Reibe-g die erste Stelle eingeräumt, während die Verschlussformen nur daneben erwähnt wurden. 'An zweiter, nicht an erster Stelle' — um aus dem Vorwort der vierten Auflage (1898) des genannten Schriftchens zu zitieren — 'gab ich sie deshalb, weil das Verschluss-g in Norddeutschland im allgemeinen nur auf der Bühne, und selbst dort nicht unbestritten, herrschte, in dem verschlussprechenden Süden aber kaum eine Neigung zu orthoepischem Einverständnis — zumal auf norddeutscher Grundlage! — zu bemerken war. 'Mit beidem' — fahre ich a.a.O. fort — 'ist es im Verlauf eines halben Menschenalters nachgerade anders geworden... [I]n den Schulen [hat] das inlautende Verschluss-g entschiedene Fortschritte gemacht, und zwar wohl nicht nur durch das immerhin auch hier einflussreiche Vorbild der Bühne, sondern vor allem auch wegen der Annehmlichkeit, beim Leseunterricht für An- und Inlaut-g übereinstimmende Lautwerte zu haben... Ich muss also (ich wiederhole dies aus der 5.Aufl.), wie die Dinge heute liegen, an erster Stelle empfehlen: durchgängige Verschlussausssprache im An-, In- und Auslaut, und zwar im An- und Inlaut [g], im Auslaut [k]. (208-9)

This may well be a case similar to those mentioned by Sturtevant and Jan-son.

Fourthly, it is worth mentioning that there is a certain logical restriction on the occurrence of hypercorrection which at the same time reveals a restriction on the proposals forwarded here. The nature of this restriction is as follows. Suppose, to keep to this example for expository purposes, that the rule of CONTRACTION (27 = 30, i) did not fully delete *de* after *VV*, but rather turned it into something phonological, say *d̥e*, where *d̥* is

a voiced dental spirant. From the fact that this voiced dental spirant is not already part of the Dutch 'phonemic system' it follows that the hypothetical addition of a converse rule in this particular case cannot result in hypercorrection: the converse rule would be applicable only to the output of *de* > *ɖe*, there being no other input. Clearly, this situation holds for each structural change of CONTRACTION specifying a phoneme (or phoneme-sequence) novel for Dutch. Consequently, for the balanced situation of sound change described above for CONTRACTION in Dutch, the assumption of a competing relation between the original rule and its converse will be empirically indistinguishable from the assumption of a sound change being able to stop midway just by itself. Of course, this observation does not render the idea of competition by conversion useless, but rather it delimits its domain of meaningful application to a certain well-defined class of changes: those which do *not* introduce new phonemes into the language.

In actual fact, the logical restriction on the occurrence of hypercorrection in terms of our proposals may well coincide with a meaningful restriction on the domain of the REGULARITY HYPOTHESIS proposed in the late thirties by N. van Wijk (1938: 35-6; 1939: 316-7) in order to eliminate observed irregularities. He proposes to restrict the hypothesis of 'Ausnahmslosigkeit' of sound change to those cases where the 'phonemic system' of the language is not modified by a 'therapeutic' sound change, i.e.

- (42) Théoriquement parlant, on pourrait s'attendre à des lois pareilles dans le cas des mutations purement phonologiques par lesquelles une langue crée un nouveau phonème pour combler une lacune du système phonologique. On pourrait argumenter ainsi: Pour qu'un nouveau phonème naisse, il suffit qu'un autre phonème change de timbre dans une partie des mots où il se rencontre, tandis qu'il reste intact dans les autres mots; pour ceci l'intervention d'autres forces motrices (divergence relativement grande des variations combinatoires, etc.) ne semble pas nécessaire. Il s'agit d'examiner si une telle hypothèse est confirmée par des faits réels. (316-7)

He then goes on to discuss a possible example from the history of Russian. The significant point is, that, if one follows these brief remarks by Van Wijk, there is a considerable range of overlap between the domain of the REGULARITY HYPOTHESES and that of the (technical) notion of hypercorrection developed here. If the area where the notion of 'rule conversion' is inapplicable falls outside the area where the REGULARITY HYPOTHESIS can be argued to apply on independent grounds, this will

add credence to the view of the relation between hypercorrection and the REGULARITY HYPOTHESIS defended above.<sup>16</sup>

Finally, and perhaps ultimately most importantly, I should like the above to be viewed as one further step in a series of working-proposals ('prescriptions', 'instructions', if I may) to the student of diachronic linguistics, and especially he interested in the salvation of the REGULARITY HYPOTHESIS<sup>17</sup>. More specifically, if the study of the REGULARITY HYPOTHESIS within the theory of lexical diffusion, especially as sketched in section 2, is viewed as the following pair of working-proposals:

- (43) (i) in case of residue, search for a competing change;
- (ii) if (i) fails, see if the threshold-condition is applicable;

I will have reached my aim in this paper if I have succeeded in making plausible that to this pair should be added:

- (44) (iii) if (i) and (ii) fail, search for hypecorrection, ehm . . . hypercorrection.

### Notes

<sup>1</sup> Wang mistakenly attributes these terms to Wells (1949). He appears to have misinterpreted the relevant passage from Bloch (1953), where the latter ascribes, the notions *communis* and *propria* to Wells.

<sup>2</sup> For the distinction between 'minor' and 'major' rules, cf. Lakoff (1965), Lightner (1968), and Zonneveld (1978).

<sup>3</sup> Chen's terminology in (8) suggest 'cross-over condition' rather than my 'threshold condition'. This term would be, however, too linguistically burdened to be useful.

<sup>4</sup> Vennemann acknowledges several spiritual predecessors as regards rule inversion, notably Andersen (1968), and Wang (1969). The relevant passage of Wang's paper (23, fn. 23) reads: 'Or the effects of a diachronic rule of the form  $A > B / C$  may be more simply accounted for by a reversed rule  $B > A / D$ .'

<sup>5</sup> On the *r*'s of *order* see below.

<sup>6</sup> As will be clear, DeCamp's informal notion 'mirror image rule' denotes something quite different from what is usually understood by this, i.e. pairs of rules of the schematic form (i)  $A > B / X \rightarrow Y$ , (ii)  $A > B / Y \rightarrow X$ ; cf. Bach (1968), and Anderson (1974, ch. 8).

<sup>7</sup> I borrow this useful notion from Howard (1973: 29); it denotes the *A* of a phonological rule of the schematic form  $A > B / X \rightarrow Y$ .

<sup>8</sup> Pieter Tiersma informs me that the dialect of San Francisco is unlikely to constitute a solid example of (19, ii). Further research will have to shed more light on the characteristics and fate of the predicted basic 'disapproval' dialect generated by the mechanical procedure outlined here.

<sup>9</sup> I ignore here the, despite much ado about 'concrete' phonology, indeed purely formal argument by Johansson (1973: 55) (repeated by Pullum, 1976: 71) against the 'two rules' analysis to the effect that such an analysis fails since the two environments are the same. In any case, Kahn's example suffices to falsify Johansson's claim (op. cit., 63) that '/r/-linking is confined to *r*-less dialect'.

<sup>10</sup> I owe the references given here to Johan Taeldeman.

<sup>11</sup> That is, phrased informally, something done by *adults* rather than *infants* (cf. King, 1969: ch. 4). Recently, Dinnsen (1976) has launched a similar proposal to the effect that *rule generalization* should also be viewed as, rather, *rule addition*, specifically as addition of so-called *complement rules*. It may be useful to point out here that rule inversion differs from complement rule addition in that the latter does not allow for an interchange between focus and structural change, i.e. the notion complement rule is defined solely on structural descriptions, as appears from the following definition (op. cit., 179):

A rule is a *complement rule*, and thus in the complement relation with some rule, if and only if its structural description defines a set which intersects the set defined by the structural description of some other rule and the intersection of these two sets is sufficient to define exhaustively the union of the two sets.

Secondly, *rule symmetry* differs from Brasington's (1973) *rule reciprocity* in that the subrules of a reciprocal schema:  $X < > \phi / Y \text{ --- } Z$  (op. cit., 28), defining both deletion and insertion in the same phonological environment, are ordered disjunctively rather than conjunctively with respect to one another. For a rejoinder to Brasington's proposals, cf. Roca (1975).

<sup>12</sup> Translation by WZ.

<sup>13</sup> Vide Zonneveld (1978).

<sup>14</sup> Or perhaps the rule in the form of (27) arose as a result of 'telescoping' (cf. Vennemann, 1972b: 210; Wang, 1969: 23, fn. 23) and simplification of some very early Dutch, or perhaps early Germanic processes, such as syncope of an unstressed vowel, assimilation of *d* to a following liquid, and absorption of shwa into a preceding vowel (cf. Kluyver, 1921: 295-7).

<sup>15</sup> For at least one reason why phonological rules may become unproductive, cf. Wang (1972).

<sup>16</sup> We can also express this difference between phoneme (-system) -preserving and phoneme-introducing sound changes explicitly in terms of Kiparsky's notion *opacity*, branch (iib) (Kiparsky, 1973: 79), which runs as follows:

(40) *opacity branch (iib)*

*B not derived by the process P* (i.e. underlying or derived by another process) in env. C — D.

In other words, opacity follows for a given rule by (iib) when its structural change occurs independently in the phonology of the language. This is true for CONTRACTION (27 = 30, i), since VVØ occurs both underlyingly, and as the output of independent processes of Dutch phonology (if this is indeed a coherent interpretation of opacity by (iib) for this particular case, cf. King's remark in Koutsoudas, 1976: 157). On the other hand, opacity does not follow for the hypothetical rule *de > ðe* (which means that the opposite of opacity, *transparency* follows) since by fiat no ðe is either underlying or derived in the environment C — D by another process of Dutch phonology. It is, therefore, sound changes which are transparent by definition (iib) (= 40) which cannot be accompanied by hypercorrection and, *vice versa*, the proposal of competition between a rule and its converse is 'meaningful' only for sound changes *opaque* by (iib).

<sup>17</sup> For another statement of this pragmatic view of the REGULARITY HYPOTHESIS, cf. Labov (1971: 421).

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